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HOS-TA, (THE LIGHTNING.)

Governor of the Pueblo of Jémez. Aug. 20.



# JOURNAL

OF A

## MILITARY RECONNAISSANCE,

FROM

## SANTA FÉ, NEW MEXICO,

TO THE

## NAVAJO COUNTRY,

MADE WITH THE

TROOPS UNDER COMMAND OF BREVET LIEUTENANT COLONEL JOHN  
M. WASHINGTON, CHIEF OF NINTH MILITARY DEPARTMENT,  
AND GOVERNOR OF NEW MEXICO, IN 1849.

BY

JAMES H. SIMPSON, A. M.,

FIRST LIEUTENANT CORPS OF TOPOGRAPHICAL ENGINEERS.

PHILADELPHIA:

LIPPINCOTT, GRAMBO AND CO.,

SUCCESSORS TO GRIGG, ELLIOT AND CO.

1852.



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BUREAU OF TOPOGRAPHICAL ENGINEERS,

*Washington, July 2, 1850.*

SIR: Under a resolution of the Senate of the 8th June, I have the honor to transmit the report and map of Lieutenant J. H. Simpson, Corps Topographical Engineers, of an expedition into the Navajo country in 1849.

The resolution calls for all sketches and drawings belonging to reports. In the present case there are seventy-five sketches and drawings of great interest, and highly necessary to illustrate the report. It has not been possible to have these copied in time, but, in the printing of the report, the engraver will be allowed access to the originals, from which he would rather engrave than from copies, and which course will also save time.

In the printing of the report, it is respectfully suggested that the printing of the map and sketches should be done under the superintendence of this office, from the belief that much time would be saved thereby.

Respectfully, sir, your obedient servant,

J. J. ABERT,

*Col. Corps Topographical Engineers.*

HON. G. W. CRAWFORD,

*Secretary of War.*

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SANTA FÉ, N. M., *April 11, 1850.*

SIR: I have the honor to submit, hereto subjoined, my journal and map of a reconnaissance of the country traversed by the troops under the command of Brevet Lieutenant Colonel John M. Washington, chief of the 9th military department, and Governor of New Mexico, in an expedition against the Navajo Indians, in the months of August and September of the year 1849.

In addition to the journal, will be found a number of appen-



dices, viz: "A," my report to Colonel Washington of a reconnaissance of the borders of the Navajo country, with a view to the establishment of a post; "B," a comparative vocabulary of the language of the Pueblo or *civilized* Indians of New Mexico, and of the *wild* tribes living upon its borders; "C," a letter from Assistant Surgeon John F. Hammond, of the army, giving a description of a room he saw among the ruins of *Pueblo Bonito*; "D," a schedule of minerals illustrative of the mineralogical and geological character of the country traversed; and "E," a table of geographical positions.

I also submit a number of sketches illustrative of the personal, natural, and artificial objects met with on the route, including portraits of distinguished chiefs, costume, scenery, singular geological formations, petrifications, ruins, and *fac-similes* of ancient inscriptions found engraven on the side walls of a rock of stupendous proportions, and of fair surface. For these truthful delineations, and the topographical sketches, I am indebted to my two assistants, Messrs. R. H. Kern and E. M. Kern, brothers—the former having furnished, with few exceptions, all the sketches of scenery, &c., and the latter the topography and other artistical work displayed upon the map. To both these gentlemen I tender my grateful acknowledgments for the kind, zealous, and effective manner in which they ever were found ready to co-operate with me in the discharge of my duties; and I owe it to them also to state that, having left Washington the spring previous, with orders to return from Santa Fé as soon as practicable after my exploration of the Fort Smith route, I consequently came hither unprovided with the proper appliances necessary for the most successful exhibition of their skill and labor. This circumstance will explain the unfit character, in many instances, of the paper on which the sketches have been drawn, and which it required, even such as it is, the ransacking of almost every store in the place to sufficiently supply. But these gentlemen had learned what a practical acquaintance with life, in its more destitute forms, will always develop—a ready resort to, and application of, expedients; and this readiness was not without its value, under the destitution referred to.

I also submit an herbarium of plants, which I think will not be without interest, in its relation to the botanical character of



the country passed through. For this collection I am indebted, upon my solicitation, to Assistant Surgeon John F. Hammond, who is entitled to all the credit for the zeal, industry, and labor which this department of research exhibits.

I also forward a box of minerals, the latter marked correspondingly with the numbers to be found on the margin of the schedule already referred to, as designated "D" in the appendix. A duplicate of the schedule will also be found in the box containing the minerals. These specimens, I trust, will not be without their value to the critical eye of a competent mineralogist and geologist, to whom I would be glad to have them referred. I would also respectively request that a reference be made of the plants to an accomplished botanist, for his judgment and expression as to their true character, novelty, &c. It is to be regretted, however, that, in the absence of a barometer, or other proper instrument to determine the atmospheric elevation of the localities of the plants, their normal condition in respect to climate can only be approximately arrived at, under the hypothetical elevation assumed. The same want of precision, however, does not exist in respect to the position of their localities in reference to the earth's surface, it being stated absolutely in latitude and longitude.

The comparative vocabulary of the languages of the different Pueblo Indians in New Mexico, and of the wild tribes inhabiting its confines, although by no means complete, will not, I trust, be without its value in the investigations that are being made in our country in regard to the ethnological condition of the various tribes which inhabit our domain. I think, among inferences which may be drawn, the singular, and as I believe the hitherto unknown, certainly unpublished, fact, is evolved, that, among the 10,000 (estimated) Pueblo Indians inhabiting New Mexico, as many as *six* distinct *dialects* obtain, no one showing anything more than the *faintest*, if any, indications of a cognate origin with the other. The vocabulary as distinctly shows the kindred character of the languages of the Navajos and of the Jicorillas branch of the Apache tribe of Indians.\*

\* Gregg, in his "Commerce of the Prairies," vol. 1, p. 269, says: "There are but three or four different languages spoken among them, (he is speak-



In regard to the geographical positions enumerated in appendix "E," which I determined in every instance by a series of astronomical observations, I do not claim for them that rigid approximation to the truth which a nice regard to the thermometrical and barometrical condition of the atmosphere, in the possession of the proper instruments, would have enabled me to arrive at; but I do claim for them, as they were in every instance referred chronometrically to the meridian of Santa Fé, and not to each other, and thus an accumulating error avoided, a degree of accuracy sufficiently high to subserve all the practical purposes for which the survey was made.

In regard to the map, it has been my aim to present on its face all the data necessary for a thorough knowledge of the country through which our route lay; and I think, with the information given in the table and note, no expedition can hereafter go over the same ground without being enabled to so prearrange its march as to make its progress comfortable and successful.

I cannot dismiss this introduction to my journal without acknowledging, as I now do, the important aid which I have

ing of the Pueblos of New Mexico,) and these, indeed, may be distinctly allied to each other."

The English author Ruxton, in his "Mexico and the Rocky Mountains," page 194, remarks: "The Indians of northern Mexico, including the Pueblos, belong to the same family—the Apache; from which branch the Navajos, Apaches, Coyoteros, Mescaleros, Mogeris, Yubipias, Marecopas, Chiricaquis, Chemequabis, Yumayas, (the last two, tribes of the Moquis,) and the Nijorias, a small tribe on the Gila. All these speak dialects of the same language, more or less approximating to the Apache, and of all of which the idiomatic structure is the same. They likewise all understand each other's tongue. What relation this language bears to the Mexican, is unknown, but my impression is, that it will be found to assimilate greatly, if not to be identical."

This *sweeping* declaration of Ruxton, grossly erroneous as it is, shows with what assiduous care travellers, who profess to give to the public facts as they find them, should distinguish between what they have derived second-hand, and which is, therefore, to be taken with proper distrust, and that which they have obtained directly at the fountain-head, *which is alone to be received as philosophically satisfactory*. I am the more surprised at the remarks of this author, as, from the title-page of his work, I notice that he, at the time he was making his investigations, *was a member of an "ethnological society."*



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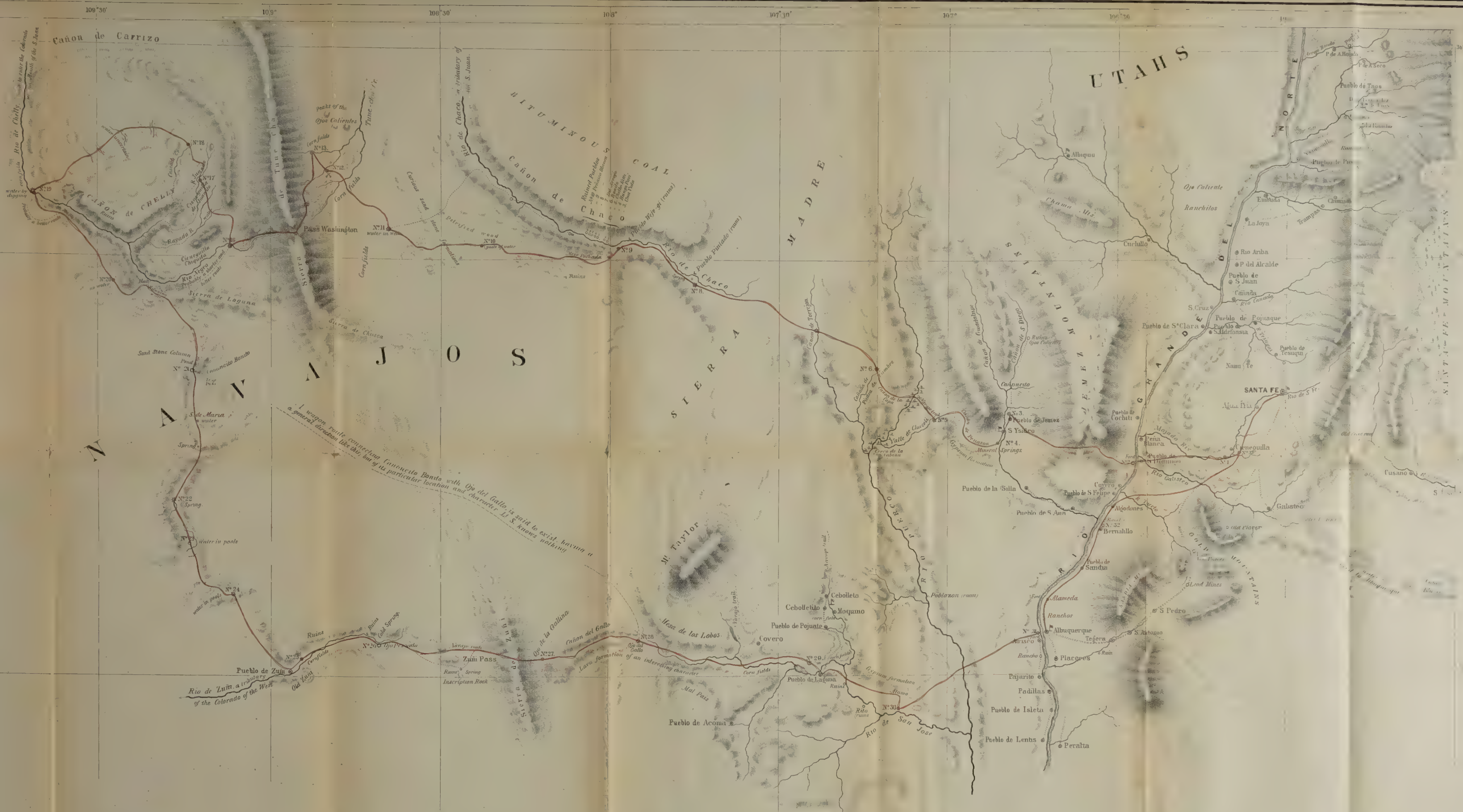
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**MAP**  
of the Route pursued in 1849 by the U.S. Troops,  
under the command of  
**Bvt. Lieut. Col. JNO. M. WASHINGTON, Governor of New Mexico,**  
in an expedition against the Navajos Indians.

BY  
**JAMES H. SIMPSON, 1<sup>ST</sup> LIEUT. T. ENG<sup>RS</sup>**  
Assisted by Mr. Edw. M. Kern.  
Constructed under the general orders of  
**Col. J.J. Abert, Chief Top<sup>l</sup> Eng<sup>rs</sup>**  
Drawn by Edward M. Kern.  
Santa Fe, N.M. 1849.

# APACHES

**NOTES.**  
For some of the data in reference to the portion of the map along the Rio Grande, Lt. S. is indebted to the Surveys of Bvt. Maj. Emory, and of Lieuts. Abert and Peck.  
— Indicates the route pursued by the Troops, the Nos designating the Camps.  
\* Denotes the points determined by astronomical observations.  
At all the camps sufficient pasture was obtained for the animals, except at camps Nos. 11, 12 and 13, and here corn fodder was procured from the Navajos. Fuel was found at, or in the vicinity of every camp, and water abundantly, except in the instances stated under head of Table of Distances.  
Magnetic variation at Santa Fe, 12° 15' East.  
Mouth of Cañon of Chelly, 14° 43' East.  
Route practicable for wagons from Santa Fe to camp No. 12, from mouth of Cañon de Chelly to Santa Fe by return route, the first 5 miles being deviated from as indicated on the map, in order to avoid some rocky hills.  
— Indicates the points at present occupied by troops.  
Doubtless the route to Chelly by way of Pass Washington might be shortened by cutting across from Camp No. 16 to Sierra Laguna and intersecting return route, as marked on the map; next camp then should be at place marked "Halt". With the command were 1 Six prdr. and 3 mountain howitzers, which traversed the whole route.  
The Indian Towns of New Mexico are all indicated by the Prefix "Pueblo", as Pueblo de S<sup>to</sup> Domingo, Pueblo de Jemez, &c.

TABLE OF DISTANCES, WITH REMARKS IN RELATION TO THE ROUTE.

N <sup>o</sup> of Camps.	Distances from Camp to Camp.	Distances from Santa Fe.	Remarks
Camp. N <sup>o</sup> 1	Miles	16 02 Miles.	
2	14 85	30 87	
Near Jemez. 3	26 60	57 47	
Camp. 4	5 78	63 25	
5	46 27	79 52	Water only to be depended on during the wet season.
6	13 27	92 79	do
7	13 55	106 34	do
8	24 45	127 79	
9	14 86	142 65	do
10	24 53	167 18	do
11	14 60	181 78	do
Tune Cha. 12	17 21	198 99	
Camp. 13	4 32	203 31	This camp is unnecessary, a more direct route to camp 14 from camp 12 is indicated.
14	10 00	213 31	
15	6 00	219 31	
16	12 00	231 31	
17	13 43	244 74	
18	7 39	252 13	
Cañon de Chelly. 19	26 45	278 58	Water got by digging.
Camp. 20	20 50	299 08	No water at this camp can be found 7 miles farther.
21	24 85	323 93	
22	23 02	346 95	
23	8 29	355 22	Water in pools, uncertain.
24	12 08	367 30	do
Near Zuñi. 25	17 45	384 75	
Camp. 26	13 71	398 46	
27	27 14	425 60	
28	18 49	443 09	
Near Laguna. 29	28 93	472 02	
Camp. 30	18 51	491 53	Water uncertain.
Albuquerque. 31	28 33	519 86	
Camp. 32	20 70	540 56	
Delgaditos. 33	30 75	571 31	
Santa Fe	15 80	587 11	







received in the prosecution of my researches from the following-named gentlemen, who have assisted me in various ways, but chiefly by kindly interpreting for me, which their knowledge of the Spanish enabled them to do, whenever I found it necessary to call upon them: Chief Justice Joab Houghton; Señor Vigil, secretary of the province; Mr. Samuel Ellison, official translator in the State department; Mr. James L. Collins, official interpreter to Colonel Washington on the expedition; Assistant Surgeons Lewis A. Edwards, Horace R. Wirtz, and John F. Hammond, of the army; and Captain Henry L. Dodge and Lieutenant Lorenzo Tores, of the Mexican volunteers.

I must also express my acknowledgments to Brevet Major Henry L. Kendrick, who daily furnished me with the distances from camp to camp indicated by the odometer which was attached to a wheel of one of his gun-carriages.

To the Topographical Department I must also express my obligations for the opportune receipt of the work entitled "A collection of tables and formulæ useful in geodesy and practical astronomy, by Captain Thomas J. Lee," of the corps, and which forms "No. 3" of the "papers relating to the duties of the Corps of Topographical Engineers." This work I found exceedingly useful in the solution of the astronomical problems and geodetic operations incidental to my duties; and, containing, as it does, *multum in parvo*, and that in a comprehensive as well as succinct form, I cannot but regard it, on account of the facilities which it affords for the prompt and scientific solution of the astronomical and geodetic questions to which our duties are constantly giving rise, as a most valuable contribution to the corps.

J. H. SIMPSON,  
*First Lieut. Corps Top. Eng.*

COLONEL JOHN J. ABERT,  
*Chief Corps of Top. Engineers, Washington, D. C.*







# JOURNAL.

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SANTA FÉ, NEW MEXICO, *August 14, 1849.*

TO-DAY the following orders were issued from headquarters:

## [ORDERS No. 32.]

HEADQUARTERS, 9TH MILITARY DEPARTMENT,  
*Santa Fé, New Mexico, August 14, 1839.*

I. The colonel commanding intending to make a movement against the Navajo Indians, the following troops will rendezvous at Jémez, subject to further orders:

Four companies of the 3d infantry, under the command of Brevet Lieutenant Colonel Alexander, 3d infantry; two companies of the 2d artillery, under command of Brevet Major Kendrick, 2d artillery; Captain Ker's company, (K,) 2d dragoons; and Captain Chapman's mounted company of volunteers.

The infantry and artillery commands will move from Santa Fé on the morning of the 16th instant; and Captains Ker and Chapman will move with their companies and be at Jémez on the 19th instant. The artillery command will take one six-pounder gun and three mountain howitzers, in addition to their other guns.

II. The quartermaster's department will provide pack mules and packs for the transportation of the necessary baggage of the command, and for thirty days' rations for five hundred men; and the commissary department will furnish the necessary subsistence stores.

III. Lieutenant Simpson, Topographical Engineers, will accompany the expedition, making such a survey of the country as the movements of the troops will permit.

IV. Assistant Surgeon Hammond will leave the general hos-



pital in charge of a citizen physician, until the return of Assistant Surgeon Edwards, and proceed with the command on the 16th instant.

By order of Lieutenant Colonel Washington:

JOHN H. DICKERSON,  
*Lieutenant, and A. A. A. General.*

In consequence of said orders, all the departments of the service are busily engaged in preparing for the contemplated movement.

*Santa Fé, August 15.*—To day, in consequence of information having reached headquarters for the concentration of the Utahs near Albiquiu, orders No. 32 have been so far modified that Captain Ker's company of dragoons, now stationed at Albuquerque, and Captain Chapman's company of mounted volunteers, now stationed at the *Placer*, instead of moving on Jémez, are to proceed to Albiquiu, and, in conjunction with Major Grier's company of dragoons and Captain Valdez's company of mounted volunteers, the whole under the command of Brevet Lieutenant Colonel Beall, effect, if possible, a peace with the Utahs in that quarter, or, failing in this, prosecute a war against them. Effecting a peace, Captains Ker and Chapman, with their companies, are to join the main command under Colonel Washington at Chelly. Not accomplishing a peace amicably, or by force of arms, Colonel Washington will, after accomplishing his objects with the Navajos, join the troops in the Utah country.

*First camp, August 16.*—The preparations being in a sufficient state of forwardness, the portion of the troops referred to in orders No. 32 stationed at Santa Fé took up the line of march this morning, their destination being Jémez, *via* Santo Domingo. These troops consist of two companies of the 2d artillery, ("B," commanded by Brevet Major John J. Peck; "D," by 2d Lieutenant J. H. Nones; the battalion by Brevet Major H. L. Kendrick), and four companies of the 3d infantry, ("D," commanded by Brevet Captain George Sykes; "F," by 2d Lieutenant C. B. Brower; "G," by 2d Lieutenant Andrew Jackson; and "H," by first Lieutenant Colonel E. B. Alexander)—the whole aggregating (fifty-five of artillery, and one hundred and twenty of infantry) an effective force of one hundred and seventy-five men,









Drawn by R. H. Kern from a Sketch by E. M. Kern.

VIEW OF THE PHAETON OR GOLD MOUNTAIN

from Santa Fe.

P. S. Duval's Steam Lith. Press Philad. a



under the command of Brevet Lieutenant Colonel John M. Washington, 3d artillery, commandant of the 9th military department, and Governor of New Mexico. The officers of the staff are 1st Lieutenant J. H. Simpson, Corps Topographical Engineers; Brevet 1st Lieutenant James N. Ward, 3d infantry, acting assistant quartermaster and commissary; 2d Lieutenant John H. Dickerson, 1st artillery, acting assistant adjutant general and Assistant Surgeon J. F. Hammond. Lieutenant Simpson has with him, to assist him in his duties, Mr. Edward M. Kern of Philadelphia, and Mr. Thomas A. P. Champlin, of Buffalo. In addition to the officers mentioned, James S. Calhoun, Esq., of Georgia, Indian agent, goes out with a small party of assistants to effect, in connection with the colonel commanding, a proper treaty with the Navajos; and Mr. James L. Collins accompanies Colonel Washington, as Spanish interpreter.

Wagon transportation is furnished to the troops as far as Jémez, and then pack animals are to be resorted to.

The road taken by the artillery (see accompanying map, the red line indicating the route pursued by the troops) was the usual one to Santo Domingo, *via* Agua Fria, (a small collection of *ranchos*—farms—six miles from Santa Fé,) and thence along the Rio de Santa Fé, on its east side, to Sieneguilla, a distance of 16.02 miles, where they encamped. The general course was east of south.

The infantry and my own party, having taken a more eastern route—that usually travelled by wagons to Algodones—after having marched about the same distance, sixteen miles, are encamped two miles to the east of the artillery, on a small tributary of the Rio de Santa Fé.

The face of the country to-day has been generally level—a few *arroyos* (dry beds of streams) intersecting it at intervals, and the famous Placer or Gold mountain, and the Sandia mountain, with some intermediate conical mounds, forming, to our front, the chief features of the landscape. (See Plate 1.) Saving a very narrow and interrupted margin bordering the Rio de Santa Fé between Agua Fria and Santa Fé, and which was cultivated in corn, the country has exhibited one extended barren waste, with nought to diversify it but a few dwarf or brush cedars, sparsely scattered.

At Sieneguilla—a village composed of one Roman Catholic



church and a few scattered ranchos—good grass and water are found, and sufficient fuel.

At this place, Captain Ker, with his command, has also encamped, on his way to Albiquiu. It was the intention of Colonel Washington, after reaching Santo Domingo, to make a night march upon the Utahs about Albiquiu, and thus, effecting a junction with Lieutenant Colonel Beall's command, strike the enemy a blow when he might be least expecting it; but Captain Ker's force being unexpectedly in advance of such a movement, the project was abandoned.

*Second camp, August 17.*—The infantry, as also my own party, joined the artillery, in the cañon\* of the Rio de Santa Fé, just after the latter had left their camp. The general course to-day was slightly south of west, the road threading the cañon of the Rio de Santa Fé to its mouth, a distance of six miles; thence across the margin of the Rio Grande del Norte, seven miles, to the *Pueblo de Santo Domingo*; and thence by ford across the Rio Grande to our camping-ground, directly opposite Santo Domingo—the whole march having been 14.85 miles. Through the cañon, the road, on account of rocks and boulders, and for a mile and a half before reaching Santo Domingo, on account of sand hills, was rough; the remaining portion level and good.

The cañon of the Rio de Santa Fé we found quite interesting. Varying in depth from one hundred to one hundred and fifty feet, the Rio de Santa Fé trickling through it, its *mésa* (table) heights on either side are crowned by overlying amygdaloidal trap. This trap shows eminently, in particular localities, the blackening scoriaceous effect of fire; and in some places is to be seen underlying it an earthy formation of an ashy character, and in others a reddish porphyritic rock in beds slightly dipping towards the east. At the mouth of the cañon, on its north side, is a well-defined ash-colored formation of an argillo-silicious character, disposed in layers, and presenting, with striking and pleasing effect, the appearance of the *façade* of a highly finished piece of Grecian architecture. This object cannot fail to attract the notice of the traveller.

Debouching from the cañon, an extended plain—upon which

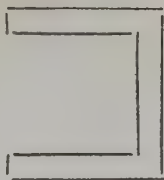
\* The word cañon is most generally applied to a deep and narrow valley enclosed on either side by escarpments. It sometimes, however, means a shallow valley.



I saw some fifty head of cattle grazing—stretches westward about six miles to the Rio Grande; the Jémez mountains appear on the further side of the river, quartering to your right; an extended *mésa* shows itself also beyond the river to your front; and the Sandia mountain lifts itself high and sublime to your left. Not a tree is to be seen until you can look down upon the Rio Grande, and then the cottonwood is noticed sparsely skirting its banks. The bed of the Rio Galisteo, which we crossed just before entering Santo Domingo, indicated only here and there that it was even moistened with water.

Santo Domingo, which lies directly on the Rio Grande, is a pueblo or Indian town, containing about eight hundred inhabitants. It is laid out in streets running perpendicularly to the Rio Grande. The houses are constructed of *adobes*, (blocks of mud, of greater or less dimensions, sun-dried;) are two stories in height, the upper one set retreatingly on the lower, so as to make the superior covering or ceiling of the lower answer for a terrace or platform for the upper; and have roofs which are nearly flat. These roofs are made first of transverse logs, which pitch very slightly outward, and are sustained at their ends by the side walls of the building; on these, a layer of slabs or brush is laid; a layer of bark or straw is then laid on these; and covering the whole is a layer of mud of six or more inches in thickness. The height of the stories is about eight or nine feet. The lower stories have very small windows, and no doors; the lights of the windows, wherever there were any, being of selenite—the crystallized foliated form of gypsum. The mode of access to the building is by exterior ladders, which may be seen leaning against every house.

In the west end of the town is an *estuffa*, or public building, in which the people hold their religious and political meetings. The structure, which is built of *adobes*, is circular in plan, about nine feet in elevation, and thirty-five in diameter, and, with no doors or windows laterally, has a small trap-door in the terrace or flat roof by which admission is gained. Directly below the opening, and detached from the wall, is a fire-place, in plan thus,





its height being about three feet—the opening referred to serving as a vent to the smoke.

The men, I notice, wear generally nothing but a shirt and a breech-cloth; the women, a dark-colored blanket, covering one shoulder, and drawn under the other, a girdle confining the blanket about the waist, and the arms being left free and bare. This appears to be their *ordinary summer dress*. The children run naked.

At the house of the governor, I noticed a woman, probably his wife, going through the process of baking a very thin species of corn cake, called, according to Gregg, *guayave*. She was hovering over a fire, upon which lay a flat stone. Near her was a bowl of thin corn paste, into which she thrust her fingers; allowing then the paste to drip sparingly upon the stone, with two or three wipes from the palm of her hand she would spread it entirely and uniformly over the stone; this was no sooner done than she peeled it off, as fit for use; and the process was again and again repeated, until a sufficient quantity was obtained—the necessarily rapid character of the process causing the perspiration to roll from her face in streams. The woman, noticing the interest I took in the operation, handed me a sheet of the food to eat. Like the Mexican *tortilla*, although I was excessively hungry, it did not fail to leave at the stomach a slight sensation of nausea. When folded and rolled together, it does not look unlike (particularly that made from the blue corn) a “hornet’s nest”—a name by which it is sometimes called.

The Rio Grande, at the ford, is about three hundred yards wide, is between three and four feet deep, and is full of bars. Its bottom, in spots, is of quicksand character—two of the wagons stalling on this account.

The country passed over to-day, excepting a very limited area upon the Rio Santa Fé, at Sieneguilla, and for a breadth of about a mile along the Rio Grande, is probably worthless for cultivation, and of but very slight, if of any, value for grazing purposes.

Our camping-ground, which is near some cornfields, is a fine one—the Rio Grande, besides furnishing us with water to drink, affording us a refreshing bath; and the grass in the vicinity being good, and wood sufficiently near.



A series of astronomical observations make the latitude of this camp  $35^{\circ} 30' 56''$ ; its longitude,  $106^{\circ} 29' 45''$ .

*Third camp, Jémez, August 18.*—Not being able last evening, on account of the strong wind, to get satisfactory astronomical observations, I obtained some this morning, before daylight.

Our route to-day, to Jémez, a distance of 26.60 miles, was generally in a northwesterly direction, and, besides being exceedingly heavy on account of sand, and rough and uneven on account of sand hills and *arroyos*, did not furnish us a drop of water throughout its whole extent.

For the first nine miles, it was up a heavy sandy *arroyo*, at the fourth mile of which there was a short steep hill to ascend, and at the ninth a rather long and steep one—which surmounted, brought us to a piece of table land of about three miles in breadth; whence could be seen, almost due west, about thirty-five miles off, the remarkable peak called *Cerro de la Cabeza*. This table land traversed, we reached the brow of the valley of the Rio de Jémez, whence, looking down upon and across the valley, a confused mass of sedimentary hills and *mésa* heights appeared to sight—the escarpment walls of the *mésa* being generally of a well-defined stratified character, and of sensible dip towards the south. To our right, and on *our* side of the Rio de Jémez, were *mésa* heights, crowned with amygdaloidal trap, apparently fifty feet thick. From the brow of the valley down to the Rio de Jémez, the road is very heavy and rough, on account of sand hills and *arroyos*.

Four miles from our last camp, I noticed on the route an outcrop of silicious limestone, containing, sparsely, some particles of felspar. Near this spot, observing a plateau or *mésa*, from two hundred to three hundred feet high, which promised a fine view of the country we had been traversing, I ascended it, to scan the landscape. As I anticipated, a noble view extended itself before me. There lay, far off towards the northeast, the Santa Fé mountains; to the southeast, the Placer mountain and Sandia mountain; intervening between them, and just discoverable, lying beyond the gleaming waters of the Rio Grande, the little town of Santo Domingo; to the north and northwest, stretching far away, were the Jémez mountains; to the south, *mésa* formations, crowned with amygdaloidal trap; and every



where else, sparsely scattered over mountain and plain, the dwarf cedar.

The Pueblo of Jémez, as its *prefix* indicates, is an *Indian* town of probably between four and five hundred inhabitants, and, like the Pueblo of Santo Domingo, is built upon two or three parallel streets, the houses being of adobe construction, and having second stories disposed retreatingly on the first, to which access is had by ladders. I notice here, on the outskirts of the village, the usual accompaniment of Mexican and pueblo towns, the ragged-looking picketed goat enclosure—it giving to the suburbs an unsightly appearance. About the premises are probably a dozen of acres covered with apricot and peach trees. An infantry company of Mexican volunteers, under command of Captain Henry L. Dodge, is stationed at this place. A sketch of the pueblo and of some curiously shaped sandstone hills in the vicinity, is given in Plate 3.

The Rio de Jémez, upon which the pueblo lies, is an affluent of the Rio Grande; varies from thirty to fifty feet in breadth; is of a rapid current; and tends southwardly. Its bed is a mixture of red sand and gravel. Patches of good corn and wheat skirt it here and there along its banks; and the extent of cultivable land bordering it may be estimated at about a mile in breadth. Its waters are palatable; good grass is found along it, and wood exists in the vicinity. Our encamping-ground, which is just to the north of the town, has, therefore, all the requisites to make it a good one.

The soil along the route to-day, excepting the narrow margin along the Rio de Jémez already mentioned, is utterly worthless for cultivation.

The latitude of this camp, by astronomical observation, is  $35^{\circ} 36' 7''$ ; its longitude,  $106^{\circ} 51' 15''$ .

*Third camp, Jémez, August 19.*—The wagon attached to headquarters breaking down yesterday, on account of the rough state of the road, it did not reach us early enough in the evening to have our tents pitched. The consequence was that the colonel commanding and his staff bivouacked for the night—a change which we found quite agreeable.

The troops will remain here for a day or two, until the assistant quartermaster, Captain Brent, can perfect his arrangements for a change from wagon to pack-mule transportation, and also for





R. H. Kern delt.

P. S. Duval's Steam Lith. Press Philad<sup>a</sup>.

from the East Aug. 20.













R H Kern del<sup>t</sup>

P S Duval's Steam Ink Press Philad<sup>a</sup>

YOU-PEL-LAY, OR THE GREEN CORN DANCE OF THE JEMEZ INDIANS.

Aug 19



the purpose of giving time for the concentration of the Pueblo and Mexican force, which is to join us at this point.

This afternoon, a dance—called, in the language of the Jémez Indians, *You-pel-lay*, or the green-corn dance—having been reported as being about to be enacted in the village, several persons from camp, (among them my assistant, Mr. E. M. Kern, from whom I get my information,) went down to witness it. In order the better to see the performances, they took up a position on one of the houses in the principal streets. (See Plate No. 6.) When the performers first appeared, all of whom were men, they came in a line, slowly walking, and bending and stooping as they approached. They were dressed in a kirt of blanket, the upper portion of their bodies being naked, and painted dark red. Their legs and arms, which were also bare, were variously striped with red, white, and blue colors; and around their arms, above the elbow, they wore a green band, decked with sprigs of *piñon*. A necklace of the same description was worn around the neck. Their heads were decorated with feathers. In one hand they carried a dry gourd, containing some grains of corn, with which they produced a rattling kind of music; in the other, a string, from which were hung several *tortillas*. At the knee were fastened small shells of the ground turtle and antelope's feet; and dangling from the back, at the waist, depended a fox skin. The musicians were habited in the common costume of the village, and made their music in a sitting posture. Their instruments consisted, each of half a gourd, placed before them, with the convex side up; upon this they placed, with the left hand, a smooth stick, and with their right drew forward and backwards upon it, in a sawing manner, a notched one. This produced a sound much like that of grinding corn upon a *matate*, (a slightly concave stone.)

The movements in the dance differed but slightly from those of Indians generally.

The party were accompanied by three elders of the town, whose business it was to make a short speech in front of the different houses, and, at particular times, join in the singing of the rest of the party. Thus they went from house to house singing and dancing, the occupants of each awaiting their arrival in front of their respective dwellings.



My second assistant, Mr. R. H. Kern, brother to my first assistant, Mr. E. M. Kern, joined me, from Taos, this afternoon.

*Third camp, Jémez, August 20.*—During the past night, we had an unusually heavy rain, attended with sharp thunder and lightning.

This morning, after breakfast, Major Kendrick, Assistant Surgeons Edwards and Hammond, Mr. E. M. Kern, and myself left camp for *Los Ojos Calientes*, (the Hot Springs,) said to be twelve miles above, in the valley of the Rio de Jémez. The Lieutenant-Governor of Jémez accompanied us as guide. Our course, which lay directly up the valley called the Cañon of San Diego, was slightly east of north. Soon after leaving camp, we passed some red-colored argillaceous rocks, well stratified, the dip of stratification on either side being anticlinal, and the gorge which we threaded being coincident with the line of strike. An upheave, therefore, must, in all probability, have taken place, the resulting force of which was doubtless normal to the line of strike. A sinking of the two series of stratification at the foot of their respective slopes could indeed have caused the like effect; but, the first mode of accounting for the phenomenon being the simplest, it is most reasonable to suppose it to have occurred.

Two miles from camp, we came to a Mexican settlement, which continued sparsely scattered along the river for about five miles. The most populous portion of it, called *Cañoncito*, we found to be about three miles from camp, at the mouth of the *Cañon de Guadalupe*. Here I saw, within a hundred yards of the village, a small gray wolf shying off very reluctantly from us.

For a distance of six or seven miles, the bottom of the Cañon de San Diego is pretty well cultivated—corn, wheat, and peppers being the chief product of the soil: the corn, which looked well, greatly predominated.

Beyond the settlements, the ruins of old *adobe* buildings were ever and anon to be seen, which, according to our guide, were once inhabited by Mexicans, who had deserted them from fear of the Navajos.

Nine miles up the *cañon* we found an old copper-smelting furnace, which looked as if it had been abandoned for some considerable period. It is quite small, is built of stone, and has arched ovens traversing each other at right angles, each oven







Drawn by R. H. Kern from a sketch by E. M. Kern.

THE OJO CALIENTE

twelve miles above Jémez.

P. S. Duval's Steam Lith. Press Philad<sup>a</sup>



being furnished with a stone grating. We picked up some fragments of copper ore (probably green malachite) which lay scattered around.

Twelve miles from Jémez, we came to Los Ojos Calientes. Here, desiring to make some examinations, and it being our purpose to regale ourselves with the eatables we had brought with us, we unsaddled our horses and turned them loose to graze.

On examination, we found the springs to be situated within the compass of a few feet of each other, some of them boiling up immediately from the bed of a small bifurcated branch of the Rio de Jémez. The principal one, which is in the branch mentioned, issues from a small knoll or heap of boulder stones, which seem to partake both of a calcareous and basaltic character, the vent not being more than a foot above the bed from which it springs. The volume of water which issues from it may be estimated at about a gallon and a half per minute. This spring, as well as all the other principal ones, show a limited accumulation of a crystalline deposit about its mouth, which, on account of its fine-grained character and hardness, may probably come under the head of travertine. The complexion of the deposit is white, with a shade of greenish yellow.

We put into the jagged cup or bowl of the fountain some eggs and raw venison, both of which were cooked in about twenty minutes. The time required to do this would doubtless have been much less had the bowl been sufficiently concave to have admitted a more perfect immersion of the articles, and the fixture of a cover, by which the heat lost through evaporation could have been retained. As it was, upon an immersion by Major Kendrick of a thermometer, Dr. Edwards assisting him, the highest point to which the mercury would rise was  $169^{\circ}$ .

These springs are said, in diseases of a cutaneous or rheumatic kind, to possess powers of a highly curative character; and it is doubtless on this account that the arbors which we noticed near the main springs are placed over some basins, scooped out from the ground, into which the hot water finds its way. A view of these springs, with their accessory scenery, and among it the tower of a distant ruined church, may be seen in Plate 14.

Observing, about a third of a mile above the springs, the ruins just mentioned, we saddled up for the purpose of visiting them. On reaching the spot, we found them to be the remains of an old Roman Catholic church, in dimensions about fifty feet front

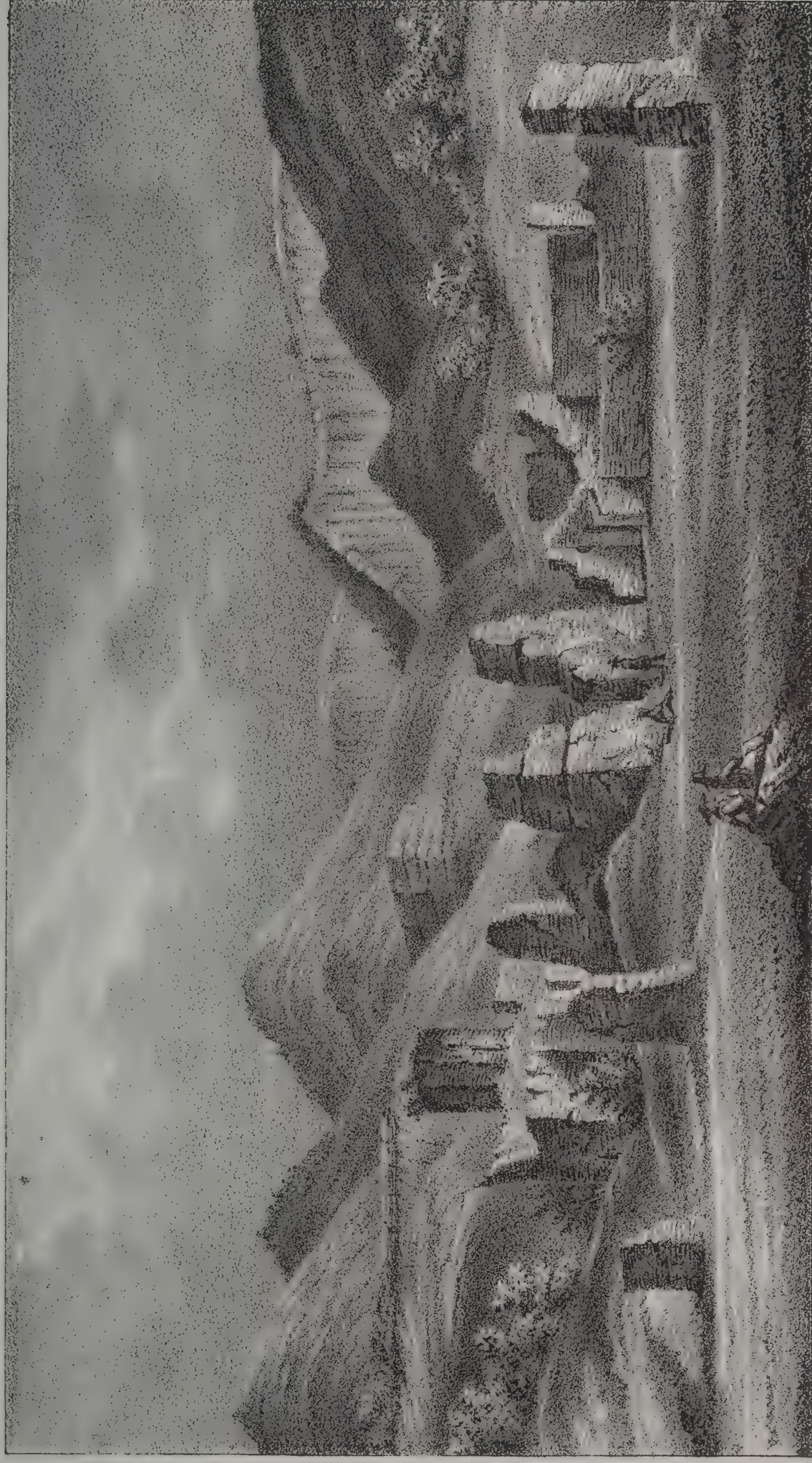
by one hundred and twenty deep. The tower, which was octagonal in form, and which rose up from the middle of the rear end of the building, was still standing, as were also the greater portion of the walls of the main building. The height of the tower I estimated at thirty feet. The thickness of the walls of the main edifice at base measured six feet. A good view of these ruins may be seen in Plate 15.

It getting late, we were obliged to hasten our return to camp—a drenching rain, which had in the mean time sprung up, adding not a little to our alacrity. A spring, however, which we unexpectedly met with on our route, tempting us by its cool appearance, we could not resist the desire to alight and try its waters, which we found not less grateful than they were unexpected.

The cottonwood, the cedar, and pine, the latter of dwarfish growth, and all rather sparsely scattered, constitute the *sylva* of the valley. The wild currant we found growing in great luxuriance and perfection about the old church.

*Third camp, Jémez, August 21.*—This afternoon, Captain Dodge, the brothers Kern, and myself visited the Roman Catholic church of the village—the governor of the town, Hosta, procuring for us the keys, and acting as *cicerone*. The church, an adobe structure, some one hundred by twenty-eight feet in plan, appeared very old, and was evidently wasting away under the combined influence of neglect and moisture. The swallows, as is to be noticed in the Roman Catholic church at Santa Fé, seemed to be perfectly at home within it, and now, as in the church mentioned, brought home to me the appositeness of those beautiful remarks of the sweet psalmist of Israel to be found in Psalms lxxxiv. 3. A pilaster and arch arrangement, with crosses at intervals, characterized the side walls; and a number of paintings, all daubs, excepting the central one, the wall back of the chancel. Hosta informed us that this central piece was a representation of San Diego bearing the cross. At present it is considerably defaced, but the touches of a genuine artist are yet visible upon it. None but a true son of the muse could have thrown into the countenance the expression of beautiful sadness with which it is radiant. In addition to the objects of garniture already mentioned, I noticed upon a projecting piece of the side pulpit a human skull and some bones, and in a side room, to which I could only peep in, some images and pictures.





Drawn by R. H. Kern from a sketch by E. M. Kern.

P. S. Duval's Steam Lith. Press, Philadelphia

# RUINS OF A ROMAN CATHOLIC CHURCH

near the Ojo Caliente twelve miles above Jémez.









R.H. Kern delt.

P.S. Duval's Steam Lith. Press.

COPIES OF PAINTINGS UPON THE WALLS OF AN ESTUFA AT JÉMEZ.

No. 1. Aug. 20.





R. H. Kern del.

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COPIES OF PAINTINGS UPON THE WALLS OF AN ESTUFA AT JEMEZ.

N<sup>o</sup> 2. Aug. 20.













H. H. K. A. A. A.

COPIES OF PAINTINGS UPON THE WALLS OF AN ESTUFA AT JÉMEZ.

P. S. Duval's Steam Lith. Press Philad. \*

N<sup>o</sup> 3-Aug. 20.





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COPIES OF PAINTINGS UPON THE WALLS OF AN ESTUFA AT JEMEZ.

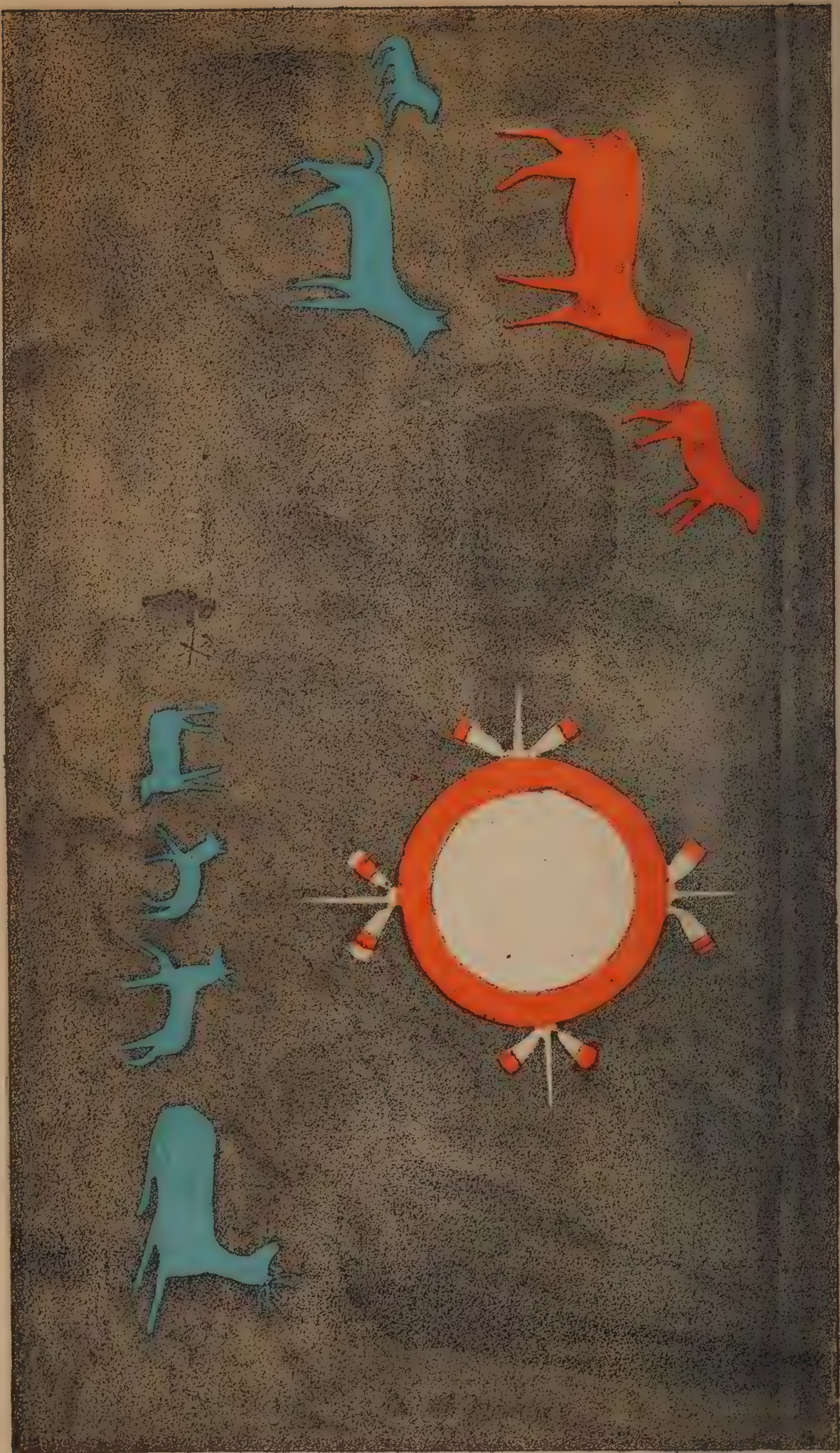
N<sup>o</sup> 4. Aug. 20.











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COPIES OF PAINTINGS UPON THE WALLS OF AN ESTUFA OF JEMEZ.

N<sup>o</sup> 5. Aug. 20.

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Finishing our examination at the church, we visited the *estuffas* of the town, of which there are two. Both are one story high, and, like the one noticed at Santo Domingo, have no doors or windows laterally, and are only accessible from above, through the flat roof. They differ from it, however, in being rectangular—the one we measured being twenty by twenty-seven feet in the clear, and seven and a half feet high. On the walls were representations of plants, birds, and animals—the turkey, the deer, the wolf, the fox, and the dog, being plainly depicted; none of them, however, approaching to exactness, except the deer, the outline of which showed certainly a good eye for proportions. For an exact picture of these, both as regards details of form and color, and also as respects the dingy, smoky complexion of the walls upon which they are painted, I refer the reader to Plates 7, 8, 9, 10, and 11.

Upon questioning Hosta in relation to the object of these *estuffas*, he informed us that they were after the custom of Montezuma, and for that reason they were not allowed to give them up. He also called them the churches of Montezuma. In the spring, he says, they go there to chant to him to send them rain; and in the fall they sing to him to obtain any good thing they may want. He further remarked—(and I give what follows to show the superstition of these people, for he narrated it as if he thought it might be true)—he further remarked, there was a tradition among his people, that Montezuma, whenever in his travels he stopped for the night, would make a house in one hour; and that he would plant corn one night, and the next morning it would be fit to be plucked. He went on further to inform us that they worshiped the sun, moon, and fire. The moon he called the captain of the night. The sun, however, when he rises, he remarked, puts away all the children of the night, and therefore he is the great captain.

To the question of the object of the paintings upon the walls of the *estuffa*, he said they were *por bonito*, (for ornament.) The circles represent the sun and moon; the semicircles, clouds; and the barbed, zigzag line, the forked, destructive lightning. The emblem of good lightning he represented in pencil upon my note-book as terminating more bluntly, thus:



The two human figures with trumpets to their mouths, which may be seen illustrated in Plate 9, here presents as the adjutants of Montezuma, who are sounding a call to him for rain.

Before the conquest, he says, according to tradition, the Jémez Indians were fighting with all the other tribes—those of San Felipe, Santa Anna, and Santo Domingo. At length a Spanish priest appeared among them very mysteriously. This priest, whenever he celebrated mass, made it a condition of his acceptance of them that they should every previous Saturday bring him wood. And it was his habit, whenever he wanted anything, such as skins or blankets, to take them. The people at length, getting enraged at such treatment, determined to kill him. He, hearing of it, however, disappeared as mysteriously as he had come. They then looked for his tracks; but, the snow having covered them up, they concluded he must have gone down the *Ojo Caliente*! (one of the hot springs I have already described.)

He further told us that, when living upon the *mésa* between the cañons of Guadalupe and San Diego, there came another *padre* (priest) among them, whom, whilst on his way to receive the confessions of a sick man, they killed. That, upon another occasion, whilst engaged in their dances, they were told that the Spaniards were below; but they did not believe it, and continued dancing. The consequence was that, one night, after a dance, and when they had retired for the night, the Spaniards came upon them with all their force, and they, having nothing but their arrows and knives to defend themselves with, closed in with one another, and began to throw each other over the precipice of the *mésa*. Just at this time, there appeared in the direction of the Cañon de Guadalupe *Nuestra Señora de Guadalupe*, (our Lady of Guadalupe,) and in the direction of the Cañon de San Diego the saint of that name! The Indians, noticing this, fled—some to Sandia, some to Isleta, and some settled here at Jémez. All, however, have since come to live at the last-mentioned place.

The *Pecos* Indians, he went on further to inform us, were the only people that speak the same language they do; that, during one of the revolutions of the country, when he was quite a youth, this tribe, being very much harassed by the Spaniards, (Mexicans,) asked permission of the people of Jémez to come and live among them. They not only granted them permission to do this, but sent out persons to help them get in their crops, and bring







R H Kern del'

P S Duval's Steam Lith Press Phil<sup>a</sup>

WHAR-TE, (THE INDUSTRIOUS WOMAN.)

Wife of the Governor of Jémez. — Aug. 20<sup>th</sup>



them and their property to their new abode. When they arrived, they gave them houses and fields. The old man and his daughter, who at the time were tending the sacred fire at Pecos, the enemy, he says, seized and beat—the daughter at length being carried away captive, and the old man escaping by the way of Galisteo to Jémez. This was the reason of the fire of Montezuma ceasing. He went on to state that the Pecos and Jémez Indians, though they speak the same language, differ somewhat in their religious customs. In relation, however, to Montezuma, the different Pueblo Indians, although speaking different languages, have the same belief. Yesterday, in getting some information from a Jémez Indian, I asked him whether they now looked upon God and the sun as the same being. He said they did. The question was then put, whether they still worshiped the sun, as God, with contrition of heart. His reply was, “Why not? He governs the world!” From this Indian I also learned that they worship the sun with most pleasure in the morning, and that they have priests to administer their own religion, which they like better than the Roman Catholic, which, he says, has been forced upon them, and which they do not understand. He said they were all the children of Montezuma, and a tradition had been current among them that they were to be delivered by a people who would come from the east; that, in consequence of the good treatment they were receiving from the Americans, they were beginning to believe that that people had come; that General Kearny had told them they would believe this more and more, because they would continue to be treated well by the Americans, and they were finding it so.

From Hosta I learn that there are now living among his people only fifteen Pecos Indians, seven being male adults, seven female, and one a little girl. One Pecos male adult, he says, is living at Cuesta, one at Santo Domingo, and one in the Cañon of Pecos. These eighteen, he states, are all that are now living of his people.

For a portrait of Hosta, in his war costume, as also of his wife, in her best attire, with some of her accessories characteristic of their mode of life, I would refer the reader to Plates 4 and 5. Hosta is one of the finest-looking and most intelligent Pueblo Indians I have seen, and, on account of his vivacity and off-hand graciousness, is quite a favorite among us. A profile

sketch of *Wash-u-hos-te*, a Pecos Indian, will also be seen in Plate 12.

*Fourth camp, August 22.*—The arrangement for transportation by pack mules being complete, and the Pueblo levies, 55 in number, having joined us, the command having also been increased by Capt. Dodge's company of Mexican volunteer infantry,\* the whole force took up its line of march to-day for the *Cañon of Chelly*.† At the same time, Brevet Lieutenant-Colonel Alexander, on account of indisposition, and Assistant Quartermaster Brent, and Assistant-Surgeon Edwards, on account of the theatre of their duties being at that post, returned to Santa Fé. Our route lay directly down the valley of the Rio de Jémez, the stream of which we crossed just above San Ysidro, a small Mexican settlement about three miles below Jémez. Three miles more brought us to our present camping ground, where we find good water, tolerable pasturage, and wood in the vicinity. The valley, as far as San Ysidro, is hemmed in by secondary mountains, and within this extent is but slightly cultivated.

At San Ysidro I called to see Señor Francisco Sandoval, the proprietor of the copper furnace we saw two days since up the Cañon de San Diego. He informs me that the mine near this furnace was worked until about three years since; that one man could get from it ten arrobas‡ of rich ore per day, and that gold was found in association with it. He further stated that he had now *cached* (buried) near the furnace twenty-three *arrobas* of pure copper.

Several times to-day, on the march, a beautiful humming-bird, the first I have seen since I left the States, has been hovering about me. The last time it paid me a visit, I was seated under a tent, where it lit for a moment within a foot or two of my person, and then disappeared not to be seen again.

The length of the march to-day has been only 5.78 miles—it having been deemed prudent, on the first day's trial with the packs, to go but a short distance.

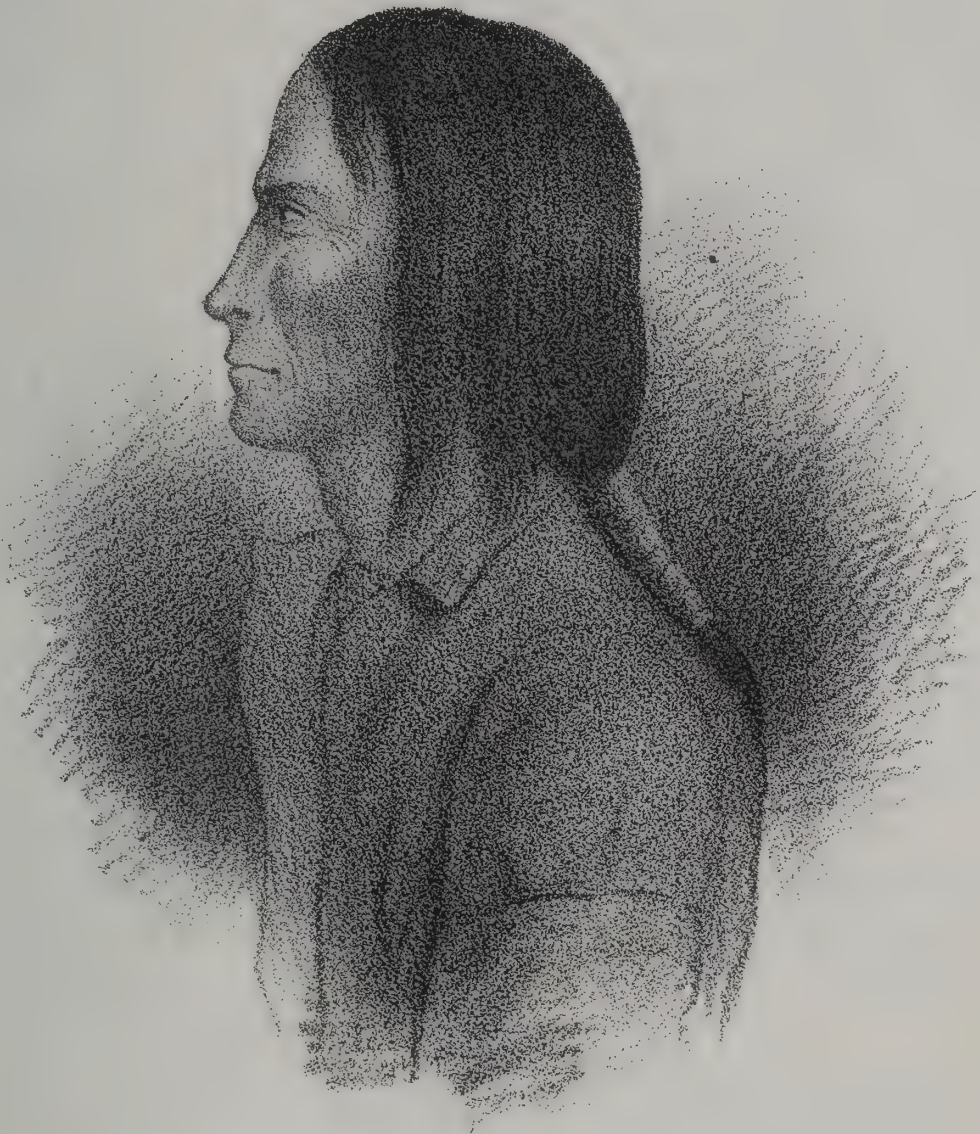
*Fifth camp, August 23.*—The troops decamped at 8 o'clock

\* Lieutenant Lorenzo Tores, a subaltern of the company, accompanied the expedition.

† The orthography of this word I get from Señor Donaciano Vigil, secretary of the province, who informs me that it is of Indian origin. Its pronunciation is *chay-e*.

‡ An arroba is a weight of twenty-five pounds.





P. S. Duval's Steam Lith. Press Philad<sup>a</sup>

WASH-U-HO-S'TEE

(*Big White Bead*)

a Pecos Indian.





this morning—a Mexican, by name Carravahal, whose residence is at *San Ysidro*, accompanying them as guide. Our course lay generally for the day, north of west, and for the first 14 miles directly up the Cañon de Peñasca—low mountains of a ridgy, primary character skirting it on the right, and mésa heights, of some 300 or 400 feet elevation, bordering it on the left. The formation of these latter is generally an ash-colored sandstone, alternating with a red argillaceous, friable rock. A mile further, and we were upon the high land dividing the waters of the *Rio de Jémez* from those of the *Rio Puerco*—an extensive prospect of the valley of the latter, with the accessories of some high isolated mountain peaks, bursting unexpectedly upon us from this point. Among the peaks are to be noticed the *Cerro de la Cabeza*, the summit of which was an object of interest on our march from the *Rio Grande* to *Jémez*. This head mountain, I perceived, resembled very much in contour, though much higher, *Cerro Tucumcarri*, a prominent landmark about 160 miles east of the *Rio Grande*, on the Fort Smith route. This mountain I described in my report of that route as resembling very much in shape the dome of the Capitol at Washington; and *Cerro de la Cabeza*, though not so good a representation, yet cannot fail to suggest to the traveler a like resemblance.

The top of the high land referred to being reached, the road commences descending towards the *Rio Puerco*, two miles further bringing us to the *Rio de Chacoli*, a small affluent of the *Puerco*, upon which we are encamped.

Two miles from our last camp, and directly on the route, are several springs of a mineral character, the taste of the water sensibly indicating the presence of soda, (probably sulphate of soda,) nitre, and some ferruginous matter. One of these springs has made for itself a basin of an elliptical shape, which is several feet in diameter, and raised about three feet above the argillaceous soil from which it flows. The incrustation about the mouth of the spring appears to be of a calcareous character, and colored with iron. These springs, on account of my having left the road to examine a geological formation, I did not see; and for the information I have given I am indebted to Majors Kendrick and Peck.

In the vicinity of the springs, cropping out from the base of the mésa, forming the south wall of the cañon, I noticed large beds of earthy gypsum, (sulphate of lime;) and constituting the supe-

rior strata of the *mésa* was a formation, some eighty feet thick, composed of an alternation of crystallized fibrous gypsum and thin layers of argillaceous shale. At the foot of the escarpment I picked up what appeared to be, from its taste and appearance, common salt, (chloride of sodium.) I afterwards noticed, four miles further on the route, another bed of gypsum.

About nine miles from our last camp, in the *cañon*, thrown together promiscuously, are some huge specimens of conglomerate boulders, one of them in magnitude probably not being short of twenty-five by twenty-five feet, or containing over fifteen thousand cubic feet. And near our present camp, there is to be seen cropping out of a side hill a red argillaceous rock, in appearance very much like that from which the Indians living on the head waters of the Mississippi make their pipes.

It is observable that the overlying amygdaloidal formation which I have already, in my journal, noticed as beginning at Sieneguilla, on the Rio de Santa Fé, and extending westward as far as the valley of the Rio de Jémez, has not been seen to-day on either side of the route. The valley, then, of the Rio de Jémez may be considered as the limit of this formation westward.

The march to-day has been 16.27 miles. The first half of the road was tolerably good; the last half very rough—the tongue of the six-pounder's limber having been broken on account of it. Not a particle of cultivable soil did we meet with until we reached the valley of the Rio de Chacoli, where we find it rich and mellow. The *sylva* has been generally the dwarf cedar, sparsely scattered; and some pines were observable on the last portion of the route.

Our camping-ground furnishes good grazing, tolerable water, and a sufficiency of wood. The water, however, cannot be depended upon, except in the wet season.

There have joined us to-day some eighty Mexican mounted militia. Our force, then, as now constituted, consists of fifty-five men of the regular artillery, one hundred and twenty of the regular infantry, fifty of Mexican volunteer infantry, fifty-five of Pueblo or Indian mounted militia, and eighty of Mexican mounted militia—in all aggregating, with the *employés* of the quartermaster's and subsistence departments, about four hundred men. The longitude of this camp, by observation, is  $107^{\circ} 3' 15''$ .



*Sixth camp, August 24th.*—We had some fine showers of rain last evening and during the night.

Seven men belonging to the Mexican mounted militia are reported to have deserted last evening.

The troops resumed the march at 8 A. M., our course for the day being generally northwest. One and a half miles from camp we crossed the *Rio de Chacoli*, a running stream, four feet in breadth and a few inches in depth, with banks six feet high, which had to be cut down to give passage to the artillery. This creek traversed, the route lay up a very shallow valley for about three and a half miles, when we got on the brow of the immediate valley of the Rio Puerco—this valley being hemmed on its west side by heights, with tableau tops and precipitous escarpment walls. The Rio Puerco, as far as visible, runs a course west of south, and is slightly fringed with the cottonwood. Cerro de la Cabeza and other mountain peaks to the south and west show well from this point. Close by the route, on its right, just before reaching the bed of the Puerco, is an old circular stone *corral* (enclosure) about thirty feet in width, and three in height, laid in mud mortar.

The Rio Puerco, which, from its great length upon the maps, we had conjectured to be a flowing stream of some importance, we found to contain water only here and there, in pools—the fluid being of a greenish, sickening color, and brackish to the taste. The width of its bottom, which is a commixture of clay and gravel, is about one hundred feet. Its banks, between twenty and thirty feet high, are vertical, and had to be graded down to allow the artillery and pack animals to cross them. The six-pounder had to be unlimbered and dragged up on the west side by men at the prolonges. A mule, with one of the howitzers packed on his back, in attempting to traverse the bed of the river, lost his footing and capsized—the howitzer, on account of its great weight, naturally seeking the lowest place, and the legs of the poor animal correspondingly tending upwards. The sight, it may well be conceived, partook both of the painful and ludicrous.

The valley of the *Rio de Chacoli* and that of the Puerco, both of which, on account of the slight elevation of the dividing ridge, may be considered as but one, and which embraces a breadth of about six miles, is, to all appearances, quite a rich body of land, and, if not ordinarily too dry, must be susceptible of productive

cultivation. It differs from the other cultivable soil we have passed over, in being argillaceous, instead of feldspathic.

A mile beyond the Rio Puerco, we entered the Cañon de la Copa, (Cup Cañon,) so called on account of the cup or vase-like appearance of some of the sandstone rocks forming its walls. (See sketch in Plate 16.) In the left hand or south escarpment wall of the cañon may be seen some well-defined and beautiful stratification, its dip being slightly *from* the valley of the Puerco, or westward. The breadth of the cañon is about one hundred and fifty yards. Among the escarpment rocks, I noticed some seams of a perfectly white saline pulverulent substance, which, from its taste, I should judge to be soda. We also found, in the same locality, in some crevices, and also attached to the rock, a dark pitchy substance, agglutinated with the excrement of birds, and of animals of the rat species.

Near these rocks are several deep and narrow *arroyos*, which required to be worked to make them practicable for the passage of the artillery.

About a half mile further, just as we emerged from the cañon, noticing on the right of the road what appeared to be bituminous coal, I examined it, and found it to be veritably such, though of an impure, slaty character. It exists in beds a foot thick, which are, in some instances, overlaid by yellowish sandstone, and then again by calcareous rock. I noticed, in some instances, superposing the coal, loose, disintegrated masses or fragments of what appeared to be a species of jasper, the evidences of igneous influence being quite apparent from its baked and blackened aspect. The coal, when fractured, occasionally discovers resinous particles of a beautiful iridescent character, the reflections being those of the garnet.

Getting out of the *Cañon de la Copa*, the country becomes very much broken by low hills of a mound or *mésa* shape, some of them, on account of the symmetry of their form, creating a degree of interest.

From twelve to fifteen miles off, on our left, have appeared, all day, a chain of pretty high mountains, some of them ridgy, and some of *mésa* shape.

After a march of 13.27 miles, falling upon an insignificant tributary of the Rio Puerco, which drains the valley called *Canada de Piedra de Lumbre*, we have encamped—the pasturage





R.H. Kern del.

NORTH WALL OF THE CAÑON DE LA COPE

(Cañon of the Cup) Aug. 24.

P. S. Duval's Steam lith. Press Philad. a









R.H. Kern del.

P. S. Duval's Stream into Frio. A. Philadel'

GERRO DE LA GABEZA IN THE VALLEY OF THE RIO PUERCO.

View taken three miles west of Camp 6. Aug. 25.





Fig. 1. Elevation

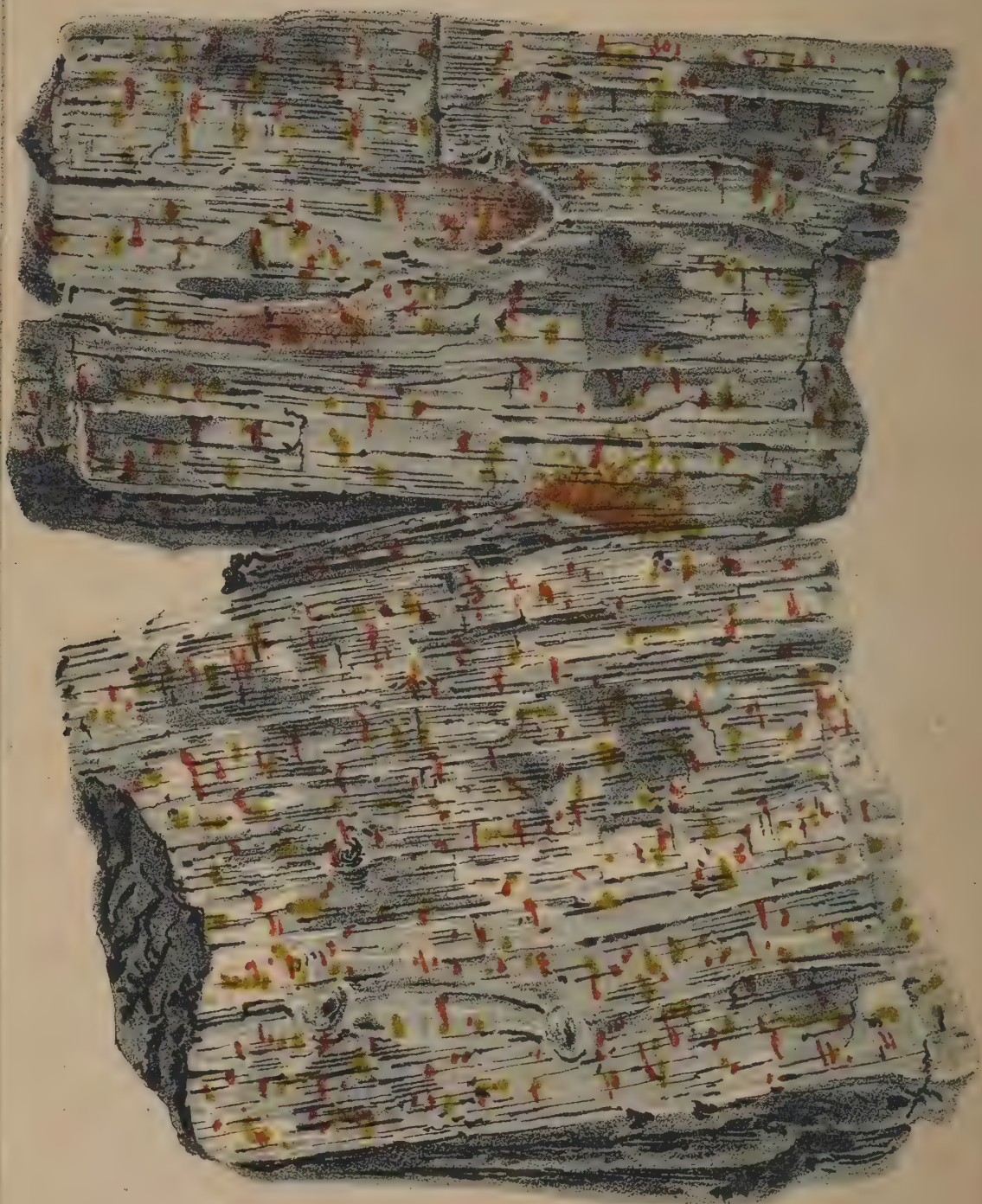
Fig. 2. Cross-section

Elevation and Cross-section of a fossilized Stamp of a tree.  
Found standing upright, in place between layers No 7 and 8.  
Height 3 ft. Diameter 2 1/4 ft. Aug 30









R. H. Kern delt.

Printed in colors at P. S. Newell Steam Lith. Press Esbnl. Phila.

View of a petrified Stump of a tree found lying split open  
as exhibited in the drasing locality between camps No 7 and 8.

Length, 4 ft Diameter, in its integrity  $2\frac{1}{2}$  ft. Aug. 26.



about our camp being but tolerable, the water (of a high clay color) barely endurable, and fuel being found in the vicinity. The water, however, can only be depended upon during the wet season.

The face of the country to-day, as usual, has presented pine and cedar, of a dwarf growth, very thinly scattered; and the *artemisia* has been seen everywhere. The soil, excepting the valley of the Rio Puerco, for purposes of cultivation, may be considered as worthless. Astronomical observations put this camp in latitude  $35^{\circ} 46' 13''$ .

*Seventh camp, August 25.*—Three more of the Mexican mounted militia are reported to have deserted yesterday.

The troops took up the line of march at 7 A.M. Our general course for the day has been about northwest. At the start our route lay through a shallow valley—a succession of them, bounded by tableau or rounded hills, crossing each other in every direction, and causing the country to have a broken appearance. A mile or two from camp, looking back, an imposing view of *Cerro de la Cabeza* presented itself. There was nothing about it to detract from its towering sublimity; and as the morning sun threw its golden light upon its eastern slope, leaving all the other portions in a softened twilight shade, I thought I had never seen anything more beautiful, and at the same time grand. (See Plate 17.)

Four miles on the route, to the left of the road, upon a little hillock, another and more extensive view of the country bursts upon you. To the south, some twenty miles off, lay an extensive range of mountains, of a *mésa* and ridgy character; intermingled with these, and diversifying the scene, were *Cerro de la Cabeza* and half a dozen other peaks, one of them quite sharp; to the east and northeast were still to be seen, stretching from north to south, from forty to fifty miles off, the Jémez mountains; and everywhere else a broken country, made up of low swelling hills, isolated cones, and *mésa* heights, sprinkled with pine and cedar of a scrub growth, and with the *artemisia*, in connection with an everywhere-prevailing dirty yellowish arenaceous soil, completed the picture.

As we proceeded on, the country stretched out more prairie-like and rolling, furnishing an extensive range of view on every hand. Six miles from our last camp, we met some very dirty,

clay-colored water, in pools, the permanency of which, however, cannot be depended on. A mile and a half further, we traversed about one-third of a mile of what appeared to be good argillaceous soil. Four miles from this, a very beautifully-shaped tableau mound appears, ranging directly in front of our course. After a march of thirteen and a half miles, coming upon an arroyo containing some water of a highly-charged clay character as scanty in quality as unpalatable to the taste, and the guide who had been sent in advance not returning in time to give the colonel commanding the information needed in respect to water to make it prudent for him to go any further for the day, the order was given to encamp.

The valley through which the *arroyo* runs is called the *Cañon de Torrijon*; and I notice a few cottonwoods skirting the *arroyo*. The pasturage about camp is but tolerable.

The soil to-day, excepting the very narrow belt already alluded to, has been worthless. The road pretty good.

About sundown, Major Kendrick and myself took a stroll about a mile from camp, in a northwest course, to a tableau mound, where we found, horizontally disposed, an outcrop of bituminous coal, of an indifferent character, on account of earthy admixtures. Sandstone both over and underlies it. We also saw an alternation of thin layers of fibrous gypsum and of arenaceous rock overlying it in places.

The latitude of this camp, by astronomical observations, is  $35^{\circ} 50' 31''$ ; its longitude,  $107^{\circ} 23' 45''$ .

*Eighth camp, August 26.*—The nights and mornings at the last two camps have been quite cold. This is doubtless owing to our great elevation. We have been ascending more or less ever since we left the Rio Grande. Indeed, from the appearance of the Jémez mountains and other indications, it is not at all unlikely that the country we have been travelling over to-day is considerably higher, atmospherically, than Santa Fé. But this point, it is to be regretted, I cannot determine, for the want of a barometer, with which it was impossible to supply myself on setting out upon the expedition. Major Emory, in his report, speaks of the absence of dew along the *Rio Gila*, and, on that account, of his scarcely ever finding it necessary to wipe his horizon-glass. I, on the contrary, find them so heavy in this region as to make it necessary for me to wipe mine often.



The troops decamped at 7 A. M.—the weather, as it generally has been, being beautiful, clear, and pleasant. Our general course during the day was northwest; and for the first seven miles the route was gradually ascending.

Just after leaving camp, we passed, to the right of the road, the beautifully-shaped mound referred to yesterday. Four miles from camp, on the right of the road, is an oblong mound or hill, about fifty feet high, exhibiting very strikingly the gradual effect of igneous action upon matter, in proportion to its proximity to the source of heat. Highly scoriaceous rocks protruded here and there through argillaceous rocks, burnt to different degrees of calcination; and a dirty yellowish friable sandstone rock crops out all around from underneath the mass. This is the first scoriaceous or lava rock I have noticed since I left the valley of the Jémez. From the mound just adverted to, *Cerro de la Cabeza* and the Jémez mountains could still be seen to our rear.

A mile and a half further on the route we came to a locality where coal crops out of the soil. Near this locality is a very shallow depression or basin caused by the washing of the rains. In this basin we found some beautiful specimens of petrified wood—in two instances the trunks of the trees still standing erect and *in situ*. One of these trunks was two feet high by two in diameter, and the other three feet high by two and a half in diameter. In another instance, a trunk of a tree, in its petrified state, had fallen over and split open, the parts lying together as if they had but just been cleft with an axe. For a sketch of two of these petrifications, see Plates 18 and 19. Do not these petrifications show that this country was once better timbered than it now is? All the *sylva* we now find—except the cottonwood occasionally to be seen on the water-courses—is a scrub growth of cedar and pine.

Prescott, in his "History of the Conquest of Mexico," speaking of the absence of forest trees in southern Mexico at the present period, remarks: "In the time of the Aztecs, the table land was thickly covered with larch, oak, cypress and the other forest trees—the extraordinary dimensions of some of which, remaining to the present day, show that the curse of barrenness in later times is chargeable more on man than nature."\*




\* Volume 1, page 9.

If by this remark this favorite author means to say that the curse of barrenness may be chargeable to the wickedness of the people who inhabit it, I can assent to it; but if, on the contrary, his idea is that its inhabitants had caused it by their own spontaneous agency, (positive or negative,) either by acts of devastation or neglect of culture, I do not perceive that a sufficient motive could be assigned to the former; and the history of rich, uncultivated lands in other portions of the world does not, in my judgment, justify the belief of the latter. Surely He who, as Revelation declares, and as the countries of the East, now in connection with sacred and profane history, attest,\* “turneth rivers into a wilderness, and the water springs into dry ground; a fruitful land into barrenness, for the wickedness of them that dwell therein;” He who “maketh the earth empty and waste;” who “turneth it upside down, and scattereth wide the inhabitants thereof,”—could also, in His sovereignty, not only have cursed, and for a similar cause, the country in question with the barrenness under which we see it languishing, but by this very means have scattered abroad its inhabitants, as the ruins everywhere attest He has done. It is, however, a pleasing thought, that He who inflicteth such judgments upon the land for the wickedness of the people dwelling therein, also, for their righteousness, “turneth the wilderness into a standing water, and dry ground into water springs; and there maketh the hungry to dwell, that they may prepare a city for habitation, and sow the fields, and plant vineyards, which may yield fruits of increase.”† But to resume my journal:

\* See Isaiah, chapter 24; also, Psalms, chapter 107, verses 33 and 34; in which the Hebrew word, which in the text is rendered “barrenness,” is also, according to the marginal reference, convertible into *saltiness*; and it is not a little remarkable that the cause of the barrenness of the soil in Old as well as New Mexico, is, in a very considerable degree, if not mainly, owing to this same condition of the earth—its saltiness.

† Psalms, chapter 107, verses 35 and 37. See also, in this connection, Major Emory’s report from California, under date of August 20, 1849, to the chief of the Corps of Topographical Engineers, from which I make this extract: “A very remarkable circumstance has occurred in that portion of the country between the mouth of the Gila river and the mountains usually called the ‘Desert,’ sometimes the ‘Jornado.’ A river forty feet wide and more than waist deep has appeared in the middle of the desert, affording delicious water to drink, making an oasis at the most convenient



Seven miles from our last camp, we reached the highest point of the land dividing the tributaries of the Gulf of Mexico from those of the Pacific. This land, on all the maps I have seen, is represented as being either of a ridgy, primary character, or of a *mésa* or *tableau* character, its lateral walls in the latter case being represented steep and deep. On some maps, it is designated as the *Sierra de los Mimbres*, in others as the *Sierra Madre*. Our exploration shows that, instead of its exhibiting in traverse section the sharp angles of the primary mountains, thus , or the flat table-shaped aspect of the mesa formation, thus , it presents more strictly the outline of a formation, thus , the country intervening between the far-distant escarpments being very considerably convex.

The highest point of land just referred to reached, we commenced gradually descending its western slope—three miles more bringing us to the Rio Chaco, a tributary of the *Rio San Juan*; and five miles more to a point whence could be seen in the distance, on a slight elevation, a conspicuous ruin, called, according to some of the Pueblo Indians with us, *Pueblo de Montezuma*; according to the Mexicans, *Pueblo Colorado*. Hosta calls it *Pueblo de Ratomes*; Sandoval, the friendly Navajo chief with us, *Pueblo Grande*; and Carravahal, our Mexican guide, who probably knows more about it than any one else, *Pueblo Pintado*.

After having marched 21.45 miles, coming to a spring of good water in a ravine to the left of the road, about a mile from the ruins, in the vicinity of which we found fuel and good grazing, we encamped.

The superior rock to-day was argillo-arenaceous; the soil the same; the route smooth and good. About a dozen hares, half a dozen doves, and one curlew, are all the game I have seen since I left Santa Fé. A wolf is seen occasionally. To-day I saw four, two of them very large.

spot for the traveller." Surely, then, here is a literal verification of the power of the Almighty to turn "a wilderness into a standing water, and dry ground into water-springs."

And I will remark here, that I was informed last summer, by a citizen of Santa Fé, who had then recently travelled the Spanish trail route, that a river had broken out very singularly also upon that route.

After partaking of some refreshment, I started off, with high expectations—my assistants, the Messrs. Kern accompanying me—to examine the ruins of *Pueblo Pintado*. We found them to more than answer our expectations. (See sketch in Plate 20.) Forming one structure, and built of tabular pieces of hard, fine-grained, compact gray sandstone (a material entirely unknown in the present architecture of New Mexico), to which the atmosphere has imparted a reddish tinge, the layers or beds being not thicker than three inches, and sometimes as thin as one-fourth of an inch, it discovers in the masonry a combination of science and art which can only be referred to a higher stage of civilization and refinement than is discoverable in the works of Mexicans or Pueblos of the present day. Indeed, so beautifully diminutive and true are the details of the structure as to cause it, at a little distance, to have all the appearance of a magnificent piece of mosaic work. (See Plate 41, drawing 1.)

In the outer face of the buildings there are no signs of mortar, the intervals between the beds being chinked with stones of the minutest thinness. The filling and backing are done in rubble masonry, the mortar presenting no indications of the presence of lime. The thickness of the main wall at base is within an inch or two of three feet; higher up, it is less—diminishing every story by retreating jogs on the inside, from bottom to top. Its elevation, at its present highest point, is between twenty-five and thirty feet, the series of floor beams indicating that there must have been originally at least three stories. The ground-plan, including the court, in exterior development, is about 403 feet. On the ground floor, exclusive of the outbuildings, are fifty-four apartments, some of them as small as five feet square, and the largest about twelve by six feet. These rooms communicate with each other by very small doors, some of them as contracted as two and a half by two and a half feet; and in the case of the inner suite, the doors communicating with the interior court are as small as three and a half by two feet. The principal rooms, or those most in use, were, on account of their having larger doors and windows, most probably those of the second story. The system of flooring seems to have been large unhewn beams, six inches in diameter, laid transversely from wall to wall, and then a number of smaller ones, about three inches in diameter, laid across them. What was placed on these does not appear, but most probably it was brush, bark, or slabs, covered with a layer





R H Kern del.

P S Duval: Steam lith Press Phila<sup>de</sup>

NORTH WEST VIEW OF THE RUINS OF THE PUEBLO PINTADO IN THE VALLEY OF THE RIO CHACO.

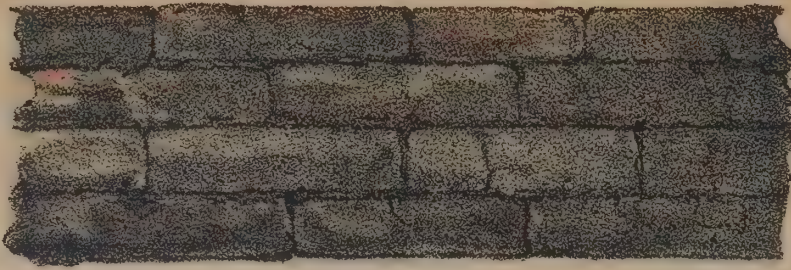
Aug. 26. - N<sup>o</sup> 1



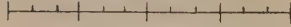




N<sup>o</sup> 1.



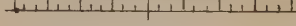
Scale of Inches.



N<sup>o</sup> 2.



Scale of Inches.



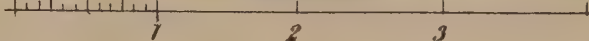
N<sup>o</sup> 3.



N<sup>o</sup> 4.



Scale of Feet.



N<sup>o</sup> 5.



Beam



Beam



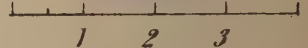
Beam

Wall.

Wall.

Wall.

Scale of Feet.





of mud mortar. (See Plate 41, drawing 5.) The beams show no signs of the saw or axe; on the contrary, they appear to have been hacked off by means of some very imperfect instrument. On the west face of the structure, the windows, which are only in the second story, are three feet two inches by two feet two inches. On the north side, they are only in the second and third stories, and are as small as fourteen by fourteen inches. At different points about the premises were three circular apartments sunk in the ground, the walls being of masonry. These apartments the Pueblo Indians call *estuffas*, or places where the people held their political and religious meetings.

The site of the ruins is a knoll some twenty or thirty feet above the surrounding plain; the Rio Chaco coursing by it, two or three hundred yards distant, and no wood being visible within the circuit of a mile.

The quarry, from which the material was obtained to build the structure, seems to have been just back of our camp.

Hosta says this pueblo was built by Montezuma and his people, when they were on their way from the north towards the south; that, after living here and in the vicinity for a while, they dispersed, some of them going east and settling on the Rio Grande, and others south into Old Mexico.

The captain of the Mexican mounted militia informs me that twenty of his men have deserted since they joined us on the 23d. The latitude of this camp is found to be  $35^{\circ} 56' 27''$ ; its longitude,  $107^{\circ} 46'$ .

*Ninth camp, August 27.*—Not finishing our examinations at the ruins of *Pueblo Pintado* yesterday afternoon, we again visited them early this morning. On digging about the base of the exterior wall, we find that, for at least two feet (the depth our time would permit us to go), the same kind of masonry obtains below as above, except that it appears more compact. We could find no signs of the genuine arch about the premises; the lintels of the doors and windows being generally either a number of pieces of wood laid horizontally side by side; a single stone slab laid in this manner; or occasionally a series of smaller ones so placed horizontally upon each other that, whilst presenting the form of a sharp angle, in vertical longitudinal section, they would support the weight of the fabric above. (See this last indicated in Plate 41, drawing 4.) Fragments of pottery

lay scattered around, the colors showing taste in their selection and in the style of their arrangement, and being still quite bright. (See Plate 22.) We would gladly, had time permitted, have remained longer to dig among the rubbish of the past: but the troops having already got some miles in advance of us, we were reluctantly obliged to quit.

Two miles over a slightly rolling country, our general course being still northwest, brought us to the commencement of the Cañon de Chaco, its width here being about two hundred yards. Friable sandstone rocks, massive above, stratified below, constitute its enclosing walls. Four miles further, on the right side of the cañon, is a habitation excavated in the rocks, its front wall being of stone and mud masonry. The height of the apartment is four feet; dimensions in plan, fourteen by fourteen feet; and size of doorway, two by two feet. Alongside of it is another small apartment, also excavated in the rocks.

Bituminous coal again makes its appearance, nine miles from our last camp, cropping out from sandstone rocks. A mile further, on the left-hand side of the road, is a stone and mortar enclosure, elliptical in shape, sixteen by eight feet in plan, and having two equal compartments. About a mile further are to be seen a number of very large sandstone boulders, which have tumbled from the rocks above, some of them containing probably as much as fifteen thousand cubic feet. In some instances, I noticed rocks of the same kind *in situ*, and just ready to tumble down. On several of these boulders were found a number of hieroglyphics—for a representation of which, see Plates 23, 24, and 25.

Thirteen miles from our last camp, we came to another old ruin, called by Carravahal *Pueblo Weje-gi*; built, like Pueblo Pintado, of very thin, tabular pieces of compact sandstone. The circuit of the structure, including the court, was near seven hundred feet. The number of apartments on the ground floor, judging from what was distinguishable, was probably ninety-nine. The highest present elevation of the exterior wall is about twenty-five feet. The great mass of rubbish below, however, shows that it must have been higher. For a sketch of these ruins in combination with the magnificent amorphous rocks of the north wall of the cañon back of them, see Plate 26; and for their ground-plan, see Plate 27.







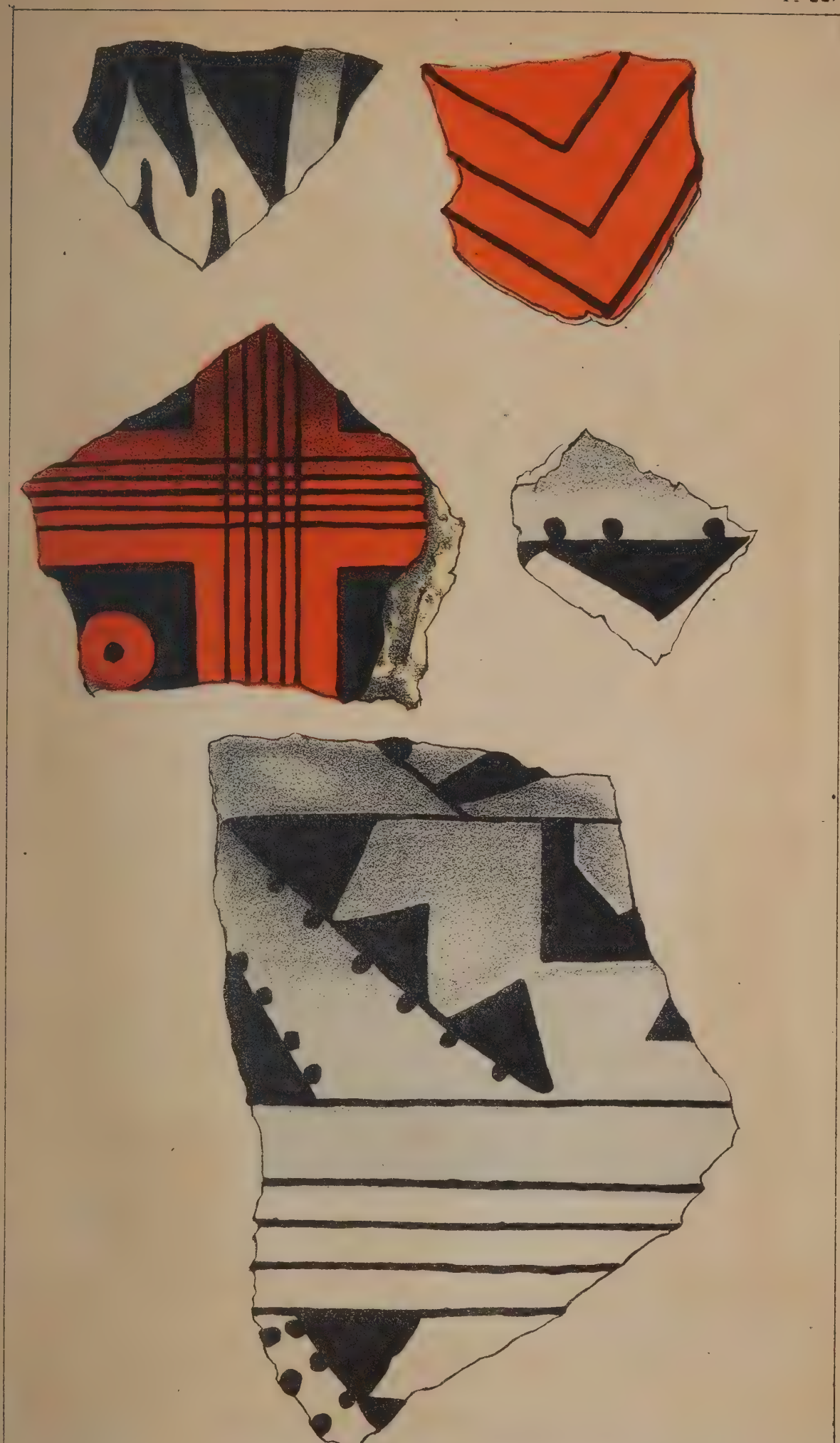
R.H.Kern delt.

Printed in Colours by P.S. Duval's Steam lith. Press Philad<sup>a</sup>

HIEROGLYPHICS ON A SAND STONE BOULDER.

Near Camp 9.





RH. Kern delt.

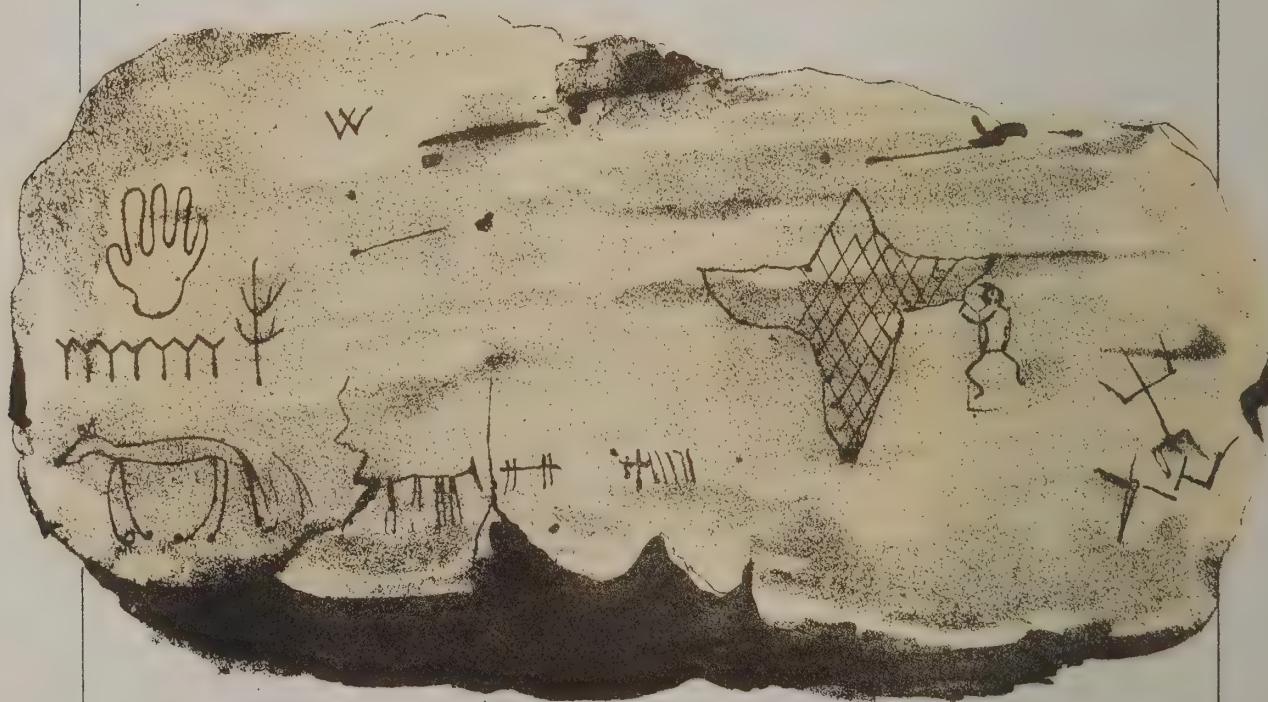
P.S. Duval's Steam lith. Press. Philad.

POTTERY found at the PUEBLO PINTADO.









E.M. Kern del<sup>t</sup>

P.S. Duval's Steam Lith. Press Phil<sup>a</sup>

HIEROGLYPHICS ON SAND STONE ROCKS.

Near Camp 9.



Eastern Side.



Southern Side.



R.H. Kern del.

Printed in colours by P. S. Duval's Steam lith. Press Philad.

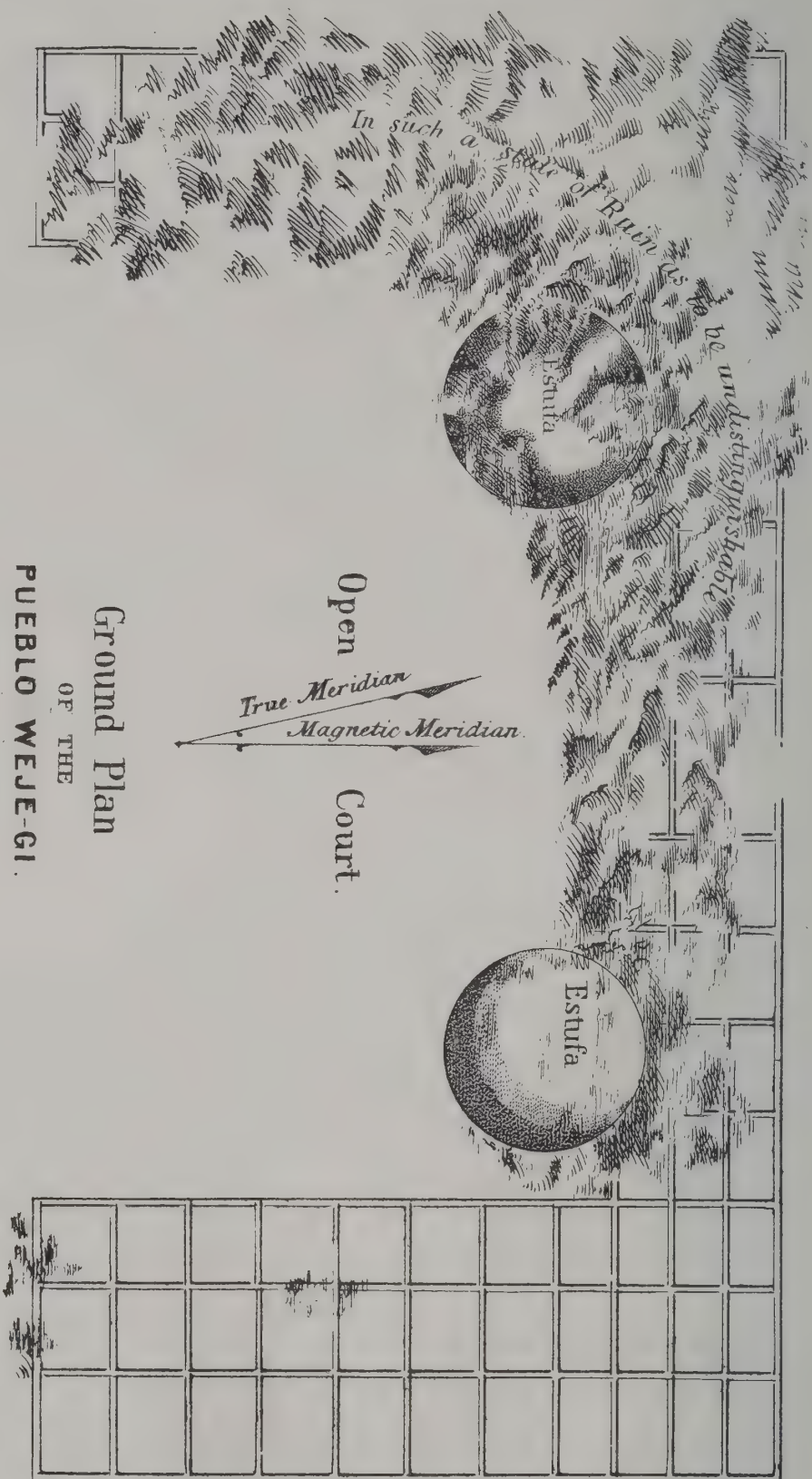
HIEROGLYPHICS ON A SANDSTONE BOULDER.

Near Camp 9.













R.H. Kern del.

F.S. Duval's Steam Lith. Press. Philad'a

SOUTH EAST VIEW OF THE RUINS OF THE PUEBLO WEJE-GI IN THE CAÑON OF CHACO.

Aug. 27. - No 2.





The view from these ruins, both up and down the cañon, is fine. Rocks piled upon rocks present themselves on either side, and in such order as to give the idea of two parallel architectural façades, converging at either extremity, at a remote distance. Another and more splendid view burst upon us as we turned an angle of the cañon, just before reaching camp. The chief object in the landscape was *Mesa Fachada*, a circular mound, with tableau top, rising abruptly, midway in the cañon, to a height of from three hundred to four hundred feet. The combination of this striking and beautiful object with the clear sky beyond, against which it was relieved, in connection with lesser mounds at its base; the serried tents of the command; the busy scene of moving men and animals in the vicinity, and the curling smoke from the camp fires, made up a picture which it has been seldom my lot to witness.

The distance travelled to-day was 14.86 miles. The road was tolerably good. Scrub cedars, very thinly scattered, were to be seen on the heights; and the *artemisia* characterized the *flora*. Some patches of good *gramma* grass could occasionally be seen along the Rio Chaco. The country, as usual, on account, doubtless, of constant drought, presented one wide expanse of barren waste. Frequently, since we left the Puerco, the soil has given indications of containing all the earthy elements of fertility, but the refreshing shower has been wanting to make it productive. The Rio Chaco, near our camp, has a width of eight feet, and a depth of one and a half. Its waters, which are of a rich clay color, can only be relied upon with certainty during the wet season.

*August 28.*—This morning, the route of the command deviating from the Cañon of Chaco, in which were represented to be some more ruins of an interesting character, I obtained permission from the colonel commanding to visit them; it being my intention to join the command upon the Chaco, which it was said the troops would strike again before halting for the night. I took with me Mr. R. H. Kern, and the guide, Carravahal, seven mounted Mexicans accompanying us as an escort. Mr. E. M. Kern was directed to continue with the troops, and keep up the topography of the route.

Proceeding down the cañon one and a half miles (its general course northwest by west), we came to an old ruined structure,

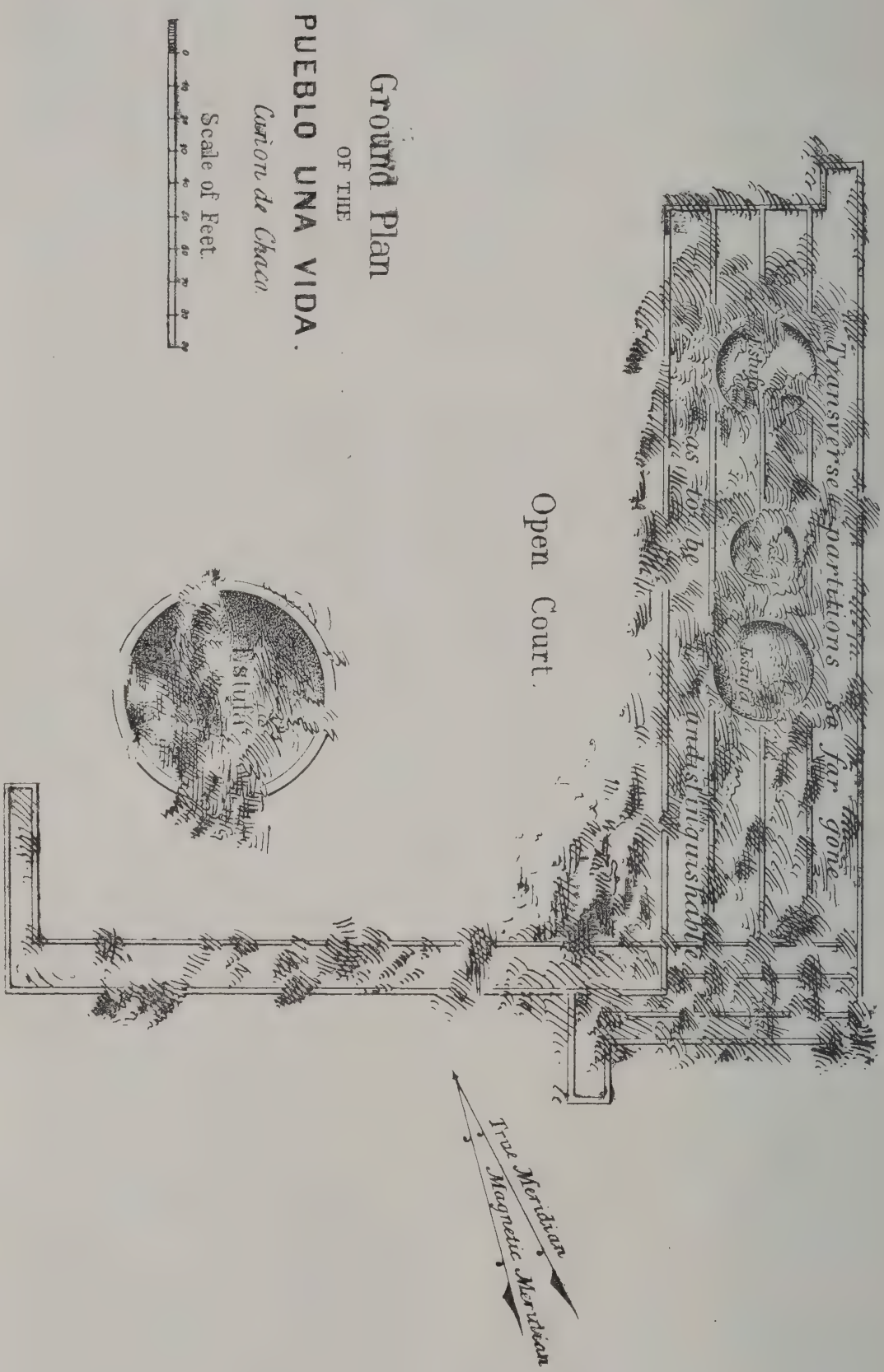
called by Carravahal *Pueblo Una Vida*. The circuit of this pueblo we found on measurement to be nine hundred and ninety-four feet. The structure has been built, like those I have already described, of very thin, tabular, fine-grained sandstone, the highest present elevation of the main walls being about fifteen feet. Two stories are now discoverable, but the mass of *debris* at the base of the walls certainly shows that there must originally have been more. The remains of four circular *estuffas* are still apparent. For a view of these ruins, with the beautiful *Mesa Fachada* in the distance, see Plate 28; and for a view of the plan of the pueblo, so far as it was distinguishable, see Plate 29.

A mile further down the cañon, we came to another pueblo in ruins, called by Carravahal *Hungo Pavie*, which he interprets Crooked Nose. These ruins show the same nicety in the details of their masonry as those I have already described. The ground-plan (for which see Plate 30) shows an extent of exterior development of eight hundred and seventy-two feet, and a number of rooms upon the ground floor equal to seventy-two. The structure shows the existence of but one circular *estuffa*, and this is placed in the body of the north portion of the building, midway from either extremity. This *estuffa* differs from the others we have seen, in having a number of interior counterforts. The main walls of the building are at base two and three-quarter feet through, and at this time show a height of about thirty feet. The ends of the floor beams, which are still visible, plainly showing that there was originally, at least, a vertical series of four floors, there must then also have been originally, at least, a series of four stories of rooms; and as the *debris* at the base of the walls is very great, it is reasonable to infer that there may have been even more. The floor beams, which are round, in transverse section, and eleven inches in diameter, as well as the windows, which are as small as twelve by thirteen inches, have been arranged horizontally, with great precision and regularity. Pottery, as usual, was found scattered about the premises; specimens of which are illustrated in Plate 32.

Continuing down the cañon one and three quarter miles further, we came to another extensive structure in ruins, the name of which, according to the guide, is *Pueblo Chettro Kettle*; or, as he interprets it, the Rain Pueblo. These ruins have an











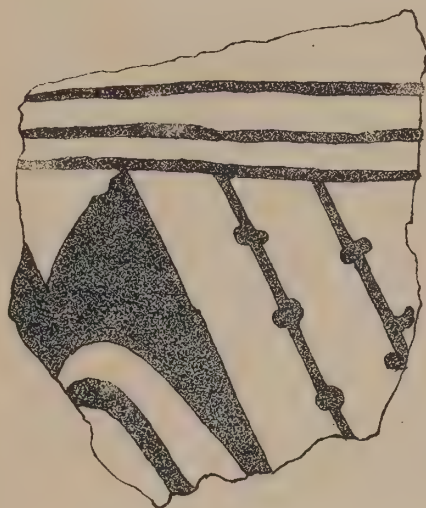
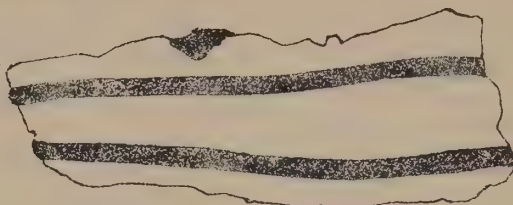
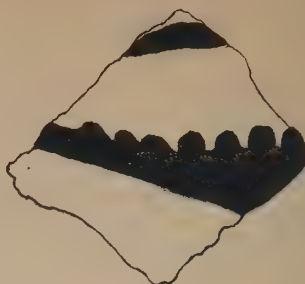
R.H. Kern delt.

P. S. Duval's Steam lith. Press. Philad.

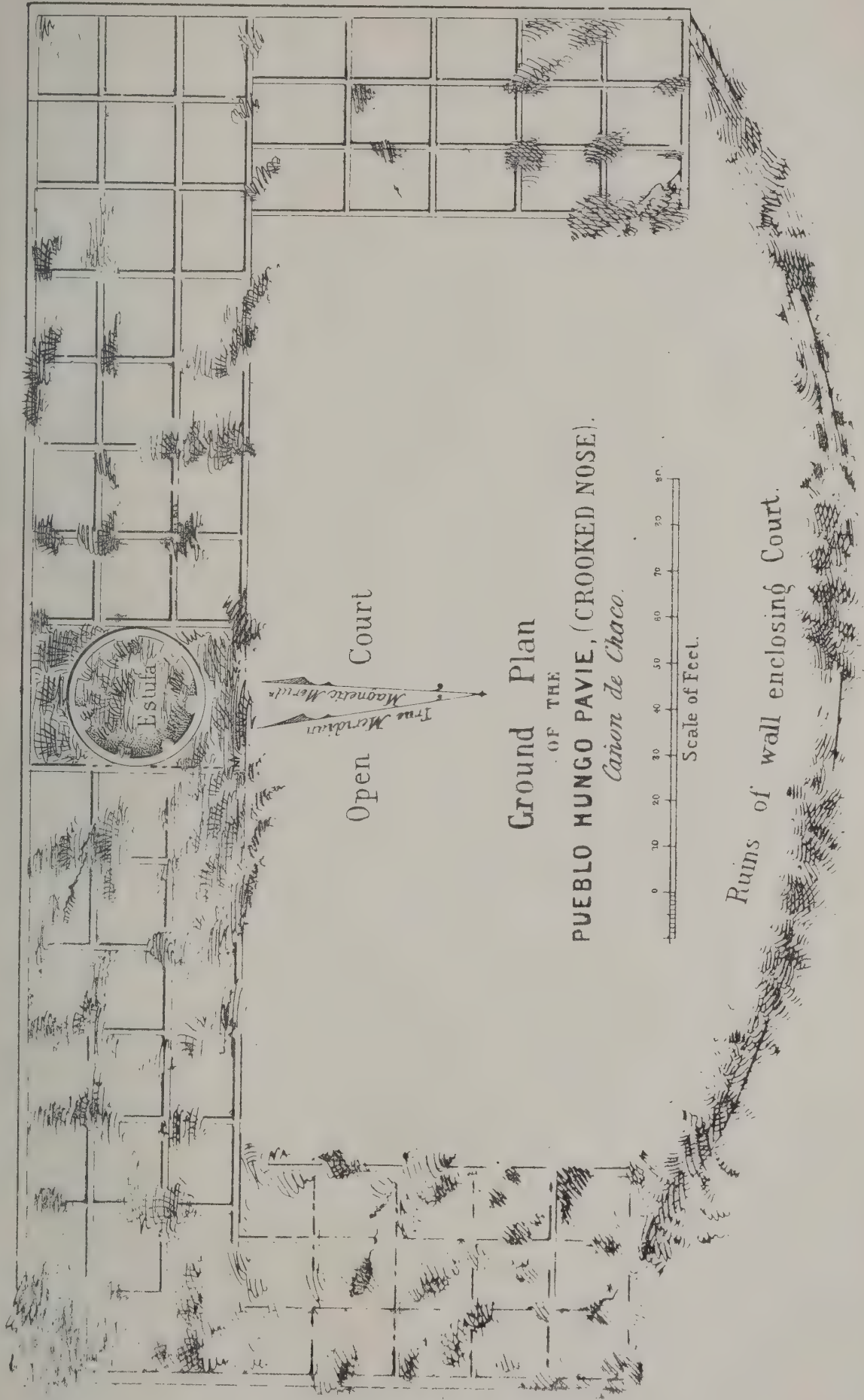
RUINS OF THE PUEBLO UNA VIDA, WITH THE MESA FACHADA IN THE DISTANCE.

Canon of Chaco. Aug. 28. - No. 3.





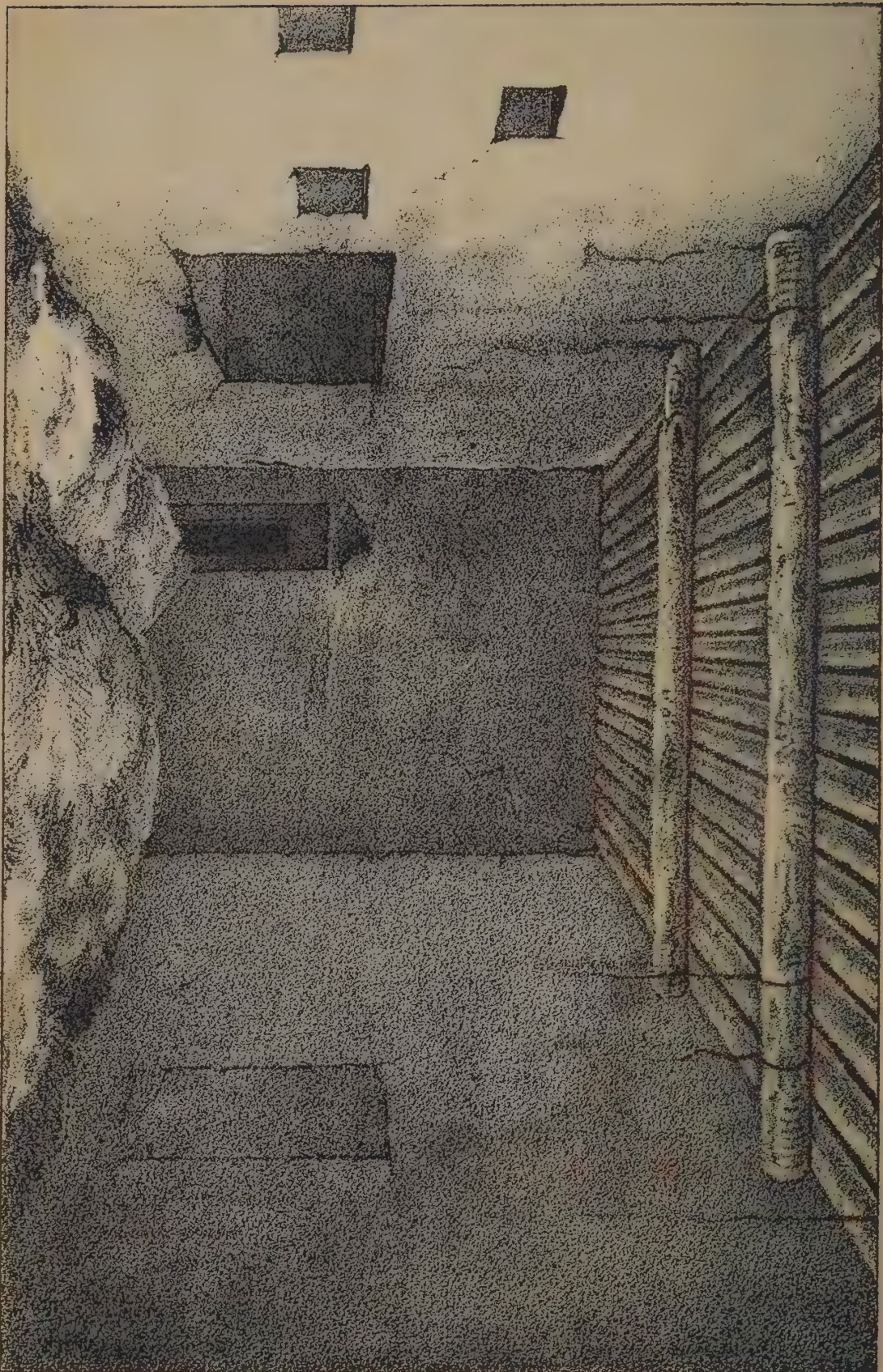












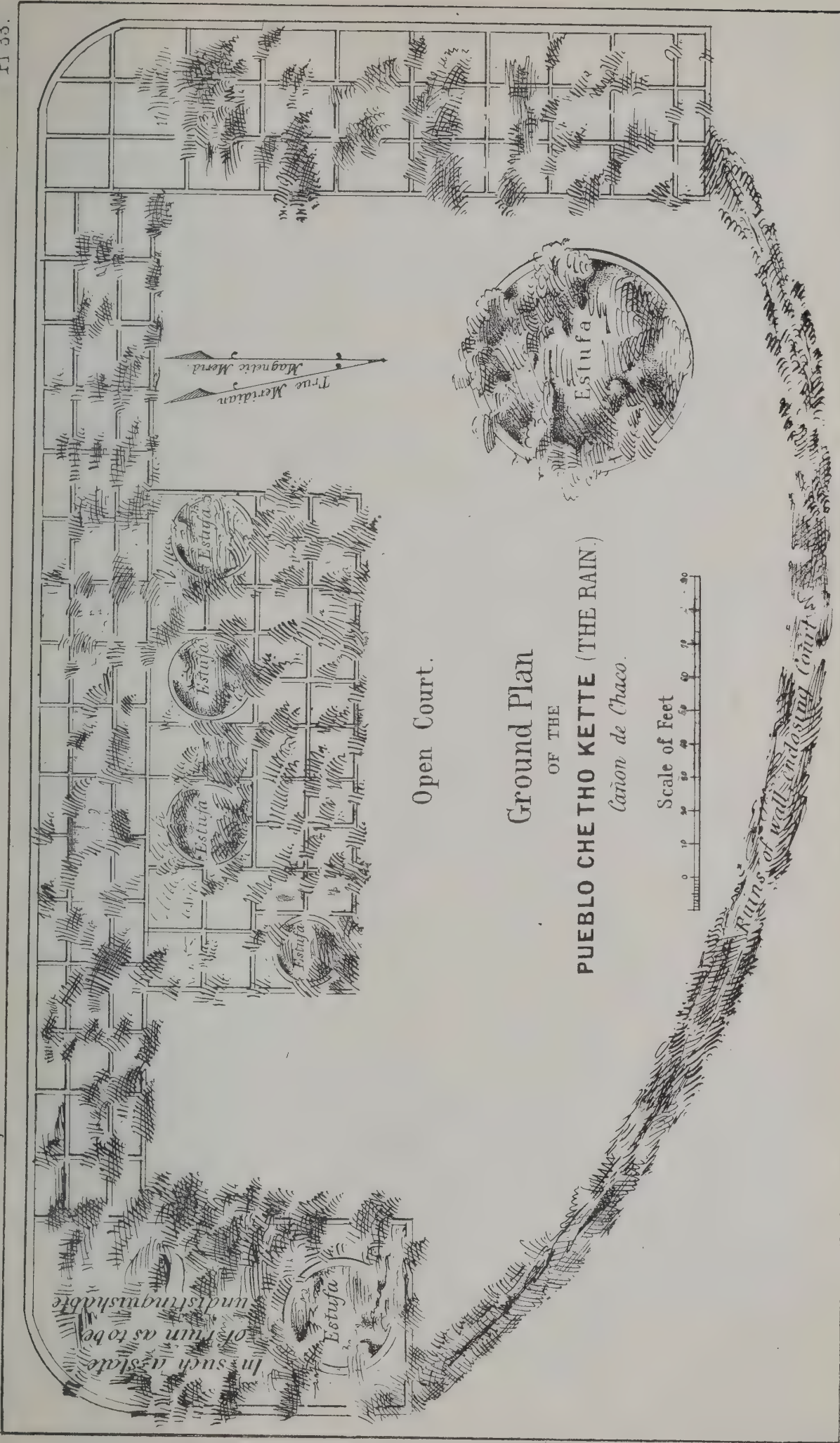
Full length.

H. S. Juval's Steam Bath Press, Philad.

INTERIOR OF A ROOM IN THE NORTH RANGE OF THE PUEBLO CHETRO-KETTE (THE RAIN).

Aug. 28<sup>th</sup> - No 5.







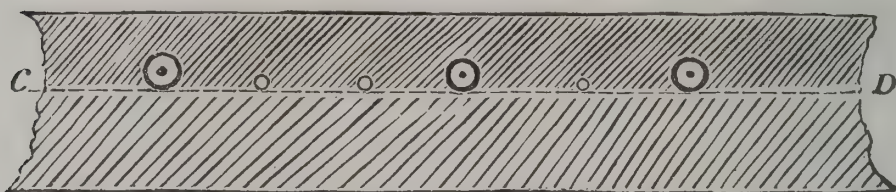


extent of exterior circuit, inclusive of the court, of about thirteen hundred feet. The material of which the structure has been made, as also the style of the masonry, is the same as that of the ruined pueblos I have already described—the stone a sandstone, and the beams pine and cedar. The number of stories at present discoverable is four—there having been originally a series of windows (four and a half by three and a half feet) in the first story, which are now walled up. The number of rooms on the first floor, all of which were distinguishable, excepting those in the west wing, must have been as many as one hundred and twenty-four. (See ground-plan of structure in Plate 33.) The circular *estuffas*, of which there are six in number, have a greater depth than any we have seen, and differ from them also in exhibiting more stories; one of them showing certainly two, and possibly three, the lowest one appearing to be almost covered up with *debris*. In the northwest corner of these ruins, we found a room in an almost perfect state of preservation, a sketch of which can be seen in Plate 34. This room is fourteen by seven and a half feet in plan, and ten feet in elevation. It has an outside doorway, three and a half feet high by two and a quarter wide, and one at its west end, leading into the adjoining room, two feet wide, and at present, on account of rubbish, only two and a half feet high. The stone walls still have their plaster upon them, in a tolerable state of preservation. On the south wall is a recess, or niche, three feet two inches high by four feet five inches wide by four feet deep. Its position and size naturally suggested the idea that it might have been a fireplace; but if so, the smoke must have returned to the room, as there was no chimney outlet for it. In addition to this large recess, there were three smaller ones in the same wall. The ceiling showed two main beams, laid transversely; on these, crosswise, were a number of smaller ones in juxtaposition, the ends being tied together by a species of wooden fibre, and the interstices chinked in with small stones; on these again, transversely, in close contact, was a kind of lathing, of the odor and appearance of cedar; all in a good state of preservation. Depending from the beams were several short pieces of rope; a specimen of which I got. The floor of the room is covered with rubbish. A large quantity of pottery lay strewn about the ruins.

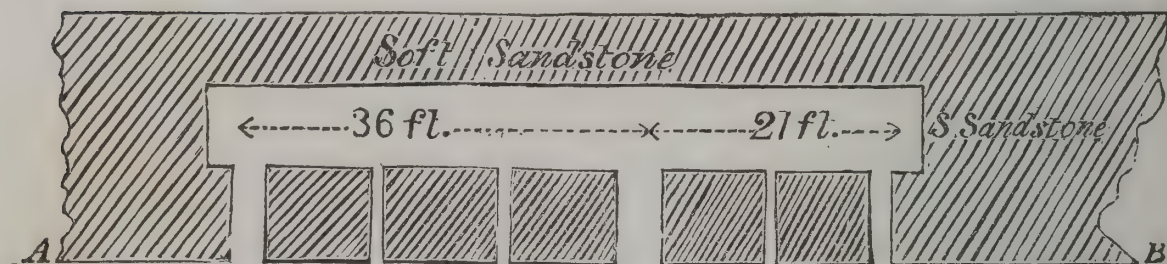
Two hundred yards further down the cañon, in its north wall,

are to be seen, about twelve feet from the ground, upon the same level, and within a number of feet of each other, three horizontal perforations, each about two feet in diameter, and having smaller ones between them, on the same line of level. Besides these perforations, there were other small ones arranged in a vertical line from the ground to one of the larger ones. What the object of these perforations may have been, it is difficult to divine, unless, indeed, back of the larger ones, and extending from one to the other, is an excavation which may answer as a hiding-place; the small orifices on the same level serving for light and ventilation, and those extending from the ground to one of the large ones as means of ascent, thus:—

*Elevation on A B, or face of wall.*



*Horizontal section on C D, or plan of excavation.*

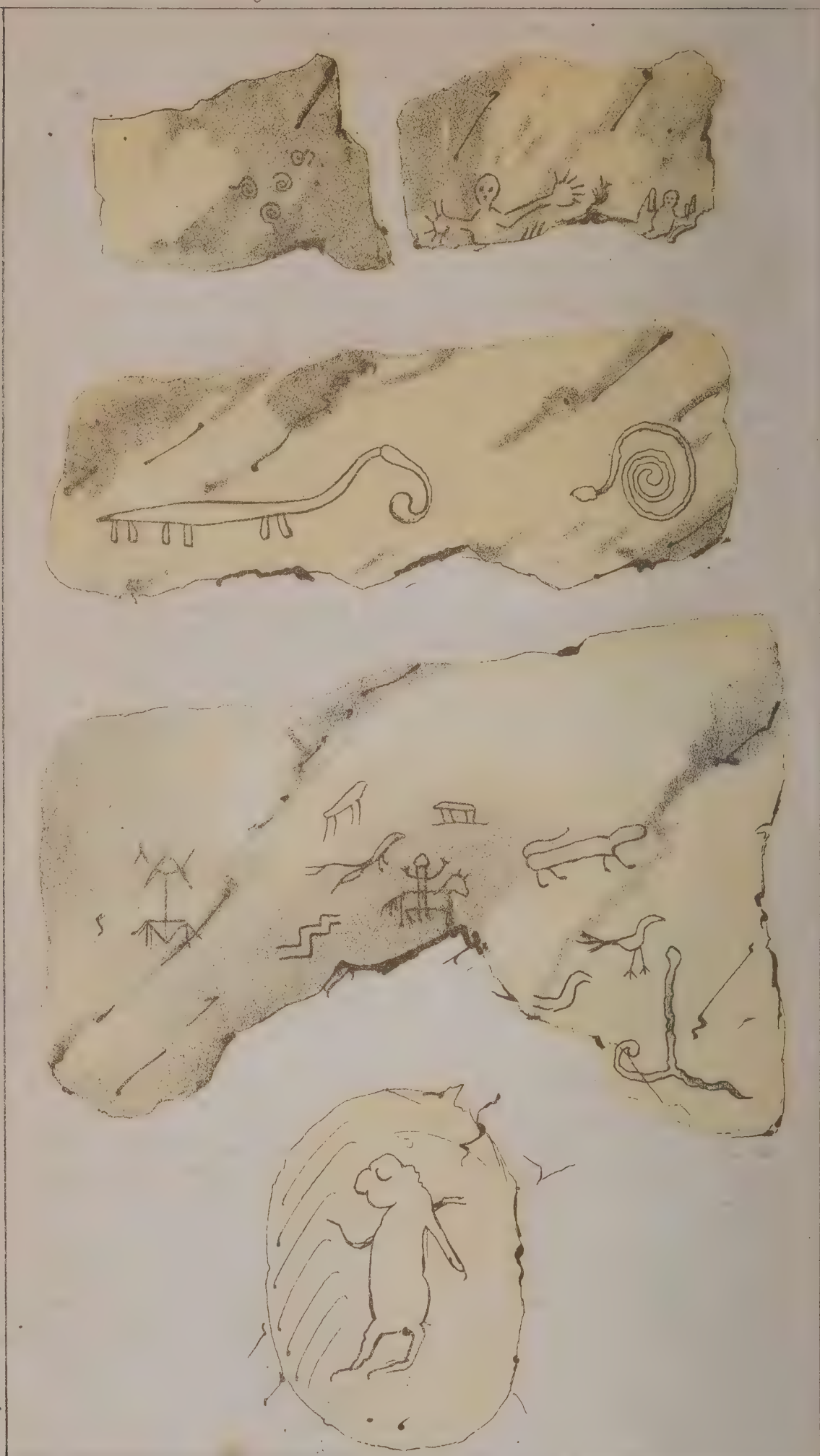


And this conjecture agrees with the statement made by one of the Mexicans with me, that it was a *casa*, (house.) It is to be regretted, however, that the want of the proper appliances to insert in the holes as steps for ascent, together with the necessity of hurrying on to the other labors of the day, did not permit us to satisfy our minds upon this point. Below the perforations on the face of the rock were a number of hieroglyphics, which are represented in part in Plate 35, some fragments of the drawings having become lost.

Two or three hundred yards down the cañon, we met another old pueblo in ruins, called *Pueblo Bonito*. For a distant view of these ruins, and the magnificent rocks back of them, see Plate 36;







B. H. Kern del.

P. S. Duval's Steam Lith. Press Phil<sup>a</sup>

HIEROGLYPHICS ON NORTH WALL OF THE CAÑON OF CHACO  
Near Ruins of the Pueblo Chetho Kette





R. H. Kern delt.

P. S. Duval's Steam lith. Press Philad.<sup>a</sup>

DISTANT VIEW OF THE RUINS OF THE PUEBLO BONITO AND ADJOINING ROCKS, IN THE CANYON OF CHACO.

Aug. 28, N° 6.









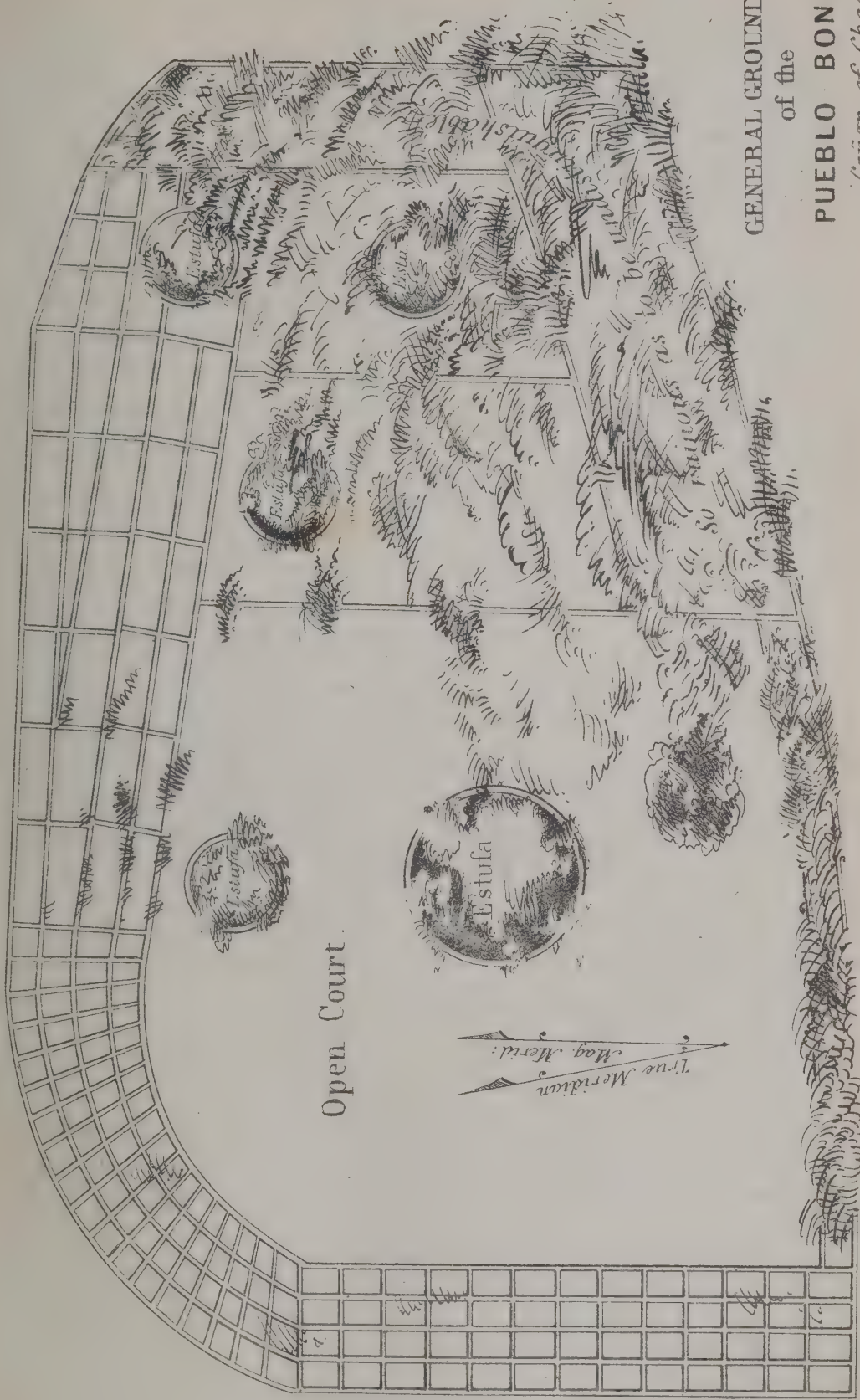
Interior

U.S. David's Steam Mill Press, Philad.

INTERIOR OF A ROOM IN THE NORTH RANGE OF THE PUEBLO BONITO.

Aug. 28<sup>th</sup> - No 6





GENERAL GROUND PLAN  
of the  
**PUEBLO BONITO.**  
*Cañon of Chaco.*  
*Circuit about 1300 feet.*





and for a view of its ground-plan, see Plate 37. This pueblo, though not so beautiful in the arrangement of the details of its masonry as *Pueblo Pintado*, is yet superior to it in point of preservation. The circuit of its walls is about thirteen hundred feet. Its present elevation shows that it has had at least four stories of apartments. The number of rooms on the ground floor at present discernible is one hundred and thirty-nine. In this enumeration, however, are not included the apartments which are not distinguishable in the east portion of the pueblo, and which would probably swell the number to about two hundred. There, then, having been at least four stories of rooms, and supposing the horizontal depth of the edifice to have been uniform from bottom to top, or, in other words, not of a retreating terrace form on the court side, it is not unreasonable to infer that the original number of rooms was as many as eight hundred. But, as the latter supposition (as will be shown presently) is probably the most tenable, there must be a reduction from this number of one range of rooms for every story after the first; and this would lessen the number to six hundred and forty-one. The number of *estuffas* is four; the largest being sixty feet in diameter, showing two stories in height, and having a present depth of twelve feet. All these *estuffas* are, as in the case of the others I have seen, cylindrical in shape, and nicely walled up with thin tabular stone. Among the ruins are several rooms in a very good state of preservation; one of them (near the northwest corner of the north range) being walled up with alternate beds of large and small stones, the regularity of the combination producing a very pleasing effect. (See drawing No. 2, Plate 41.) The ceiling of this room (see Plate 38) is also more tasty than any we have seen—the transverse beams being smaller and more numerous, and the longitudinal pieces which rest upon them only about an inch in diameter, and beautifully regular. These latter have somewhat the appearance of barked willow. The room has a doorway at each end and one at the side, each of them leading into adjacent apartments. The light is let in by a window, two feet by eight inches, on the north side. There was among the ruins another room, which, on account of the lateness of the hour and the consequent despatch of our examination, escaped our scrutiny. This room having been represented by Assistant-Surgeon J. F. Hammond and Mr. J. L. Collins (both

of whom started from camp with us) as being more perfect in its details than any of the others we had visited, and as indicating the use of *smooth* plank in the flooring, I requested the former to furnish me with a description of it. This description (thanks to the courtesy of the doctor) will be found in the Appendix "C." (For a view of the pottery found about these ruins, see Plate 40.)

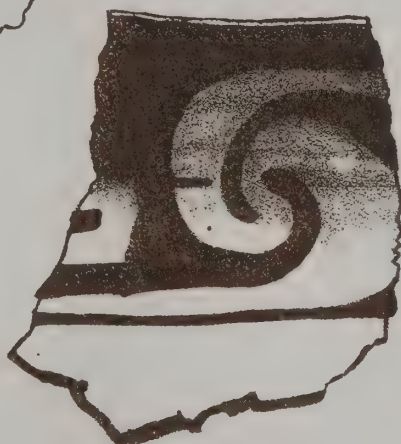
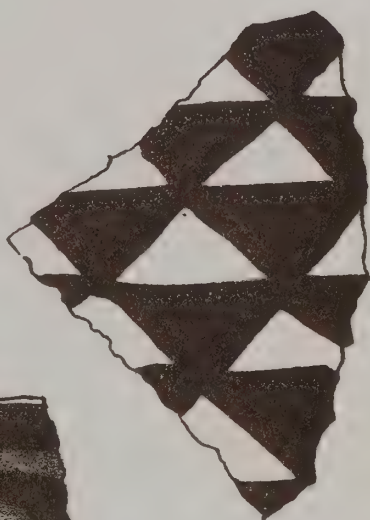
Besides the ruins of the main structure, there were some others lying just to the northeast of the pueblo, along the wall of the cañon.

A few hundred yards further down the cañon, we fell in with another pueblo in ruins, called by the guide *Pueblo del Arroyo*, the circuit of which was about one hundred feet. The day, however, being far gone, and the camp of the command doubtless many miles in advance of us, we were obliged reluctantly to forego the critical examination of these ruins which we would have been pleased to give them.

About a quarter of a mile further, we came to another small ruined edifice; and half a mile further, to still another; the style and construction of each being the same as of those already described, except that the stones of the walls were a little larger.

All the ruins we have seen to-day, up to this point, have been on the north side of the cañon, and within a few feet of its escarpment wall; the sandstone rocks composing it being magnificently amorphous, and running up to a height of about one hundred feet. Two miles further down the cañon, but on its left or south bank, we came to another pueblo in ruins, called by the guide *Pueblo de Peñasca Blanca*; the circuit of which I ascertained to be, approximately, one thousand seven hundred feet. This is the largest pueblo in plan we have seen, and differs from others in the arrangement of the stones composing its walls. The walls of the other pueblos were all of one uniform character in the several beds composing it; but in this there is a regular alternation of large and small stones, the effect of which is both unique and beautiful. The largest stones, which are about one foot in length, and one half a foot in thickness, form but a single bed; and then, alternating with these, are three or four beds of very small stones, each about an inch in thickness. (See drawing No. 2, Plate 41, for an illustration of this style of masonry.) The general plan of the structure also













R.H.Kern invt. et. pinxt.

RESTORATION OF THE PUEBLO HUNGO PAVIE, (CROOKED NOSE)

Cañon of Chaco No.4.

P. S. Duval's Steam lith. Press Philad. 3



differs from the others in approximating the form of the circle. The number of rooms at present discoverable upon the first floor is one hundred and twelve; and the existing walls show that there have been at least three stories of apartments. The number of circular estuffas we counted was seven.

The question now arises, as we have seen all the ruins in this quarter, what was the form of these buildings?—I mean as regards the continuity or non-continuity of its front and rear walls. Were these walls one plane surface from bottom to top, as in the United States, or were they interrupted each story by a terrace, as is the case with the modern pueblo buildings in New Mexico?

The front or exterior walls were evidently one plane surface from bottom to top; because, whenever we found them in their integrity, which we did for as many as four stories in height, we always noticed them to be uninterruptedly plane.

The rear walls, however, were, in no instance that I recollect of, found to extend higher than the commencement of the second story; and the partition walls were, if my memory is not at fault, correspondingly step-like in their respective altitudes. The idea, then, at once unfolds itself, that in elevation the inner wall must have been a series of retreating surfaces, or, what would make this necessary, each story on the inner or court side must have been terraced. This idea also gathers strength from the fact that we saw no indications of any internal mode of ascent from story to story, and therefore that some exterior mode must have been resorted to; such as, probably, ladders, which the terrace form of the several stories would make very convenient. Again, the terrace form of the stories would best conduce to light and ventilation for the interior ranges of apartments. The idea, then, which Mr. R. H. Kern was the first to suggest—that these pueblos were terraced on their inner or court side—is not without strong grounds of probability; and it is in consonance with this idea that, in his *restoration* of the *Pueblo Hungo Pavié*, (see Plate 31,) he has given it the form exhibited in the drawing.\*

It is a curious fact that in no single instance did we find in these ruins either a chimney or a fireplace; unless, indeed, the

\* Unwittingly, Mr. Kern has fallen one story short of the number the ruins exhibited. In their restored state, four stories should appear.

recesses described as existing in some of the rooms were used as fireplaces, which their slight height, as well as deprivation of chimney flues, would scarcely authorize. Neither were there any indications of the use of iron about the premises.

In regard to the position of the several structures in respect to the four true cardinal points of the heavens, it deviated in every instance more or less from them; but in no instance was the variation from the *magnetic* cardinal points more than five degrees, except in the case of the *Pueblo Una Vida*, where it was as great as fifteen degrees east. The magnetic variation of the needle from the true pole being, at these localities, about thirteen and a half degrees east; the deviation from the four *true* cardinal points, in the case of the *Pueblo Una Vida*, would then be as much as twenty-eight and a half degrees. In the case, however, of all the other pueblos, it was but a very few degrees.

In regard to the origin of these remains, there is nothing that I can learn conclusive in relation to it. Hosta, one of the most intelligent Pueblo Indians I have seen, says, as I have before remarked, that they were built by Montezuma and his people, when on their way from the north to the region of the Rio Grande and to Old Mexico. Sandoval, a very intelligent Navajo chief, also says they were built by Montezuma; but further states that the Navajos and all the other Indians were once but one people, and lived in the vicinity of the Silver mountain; that this mountain is about one hundred miles north of the Chaco ruins; that the Pueblo Indians separated from them, (the Navajos,) and built towns on the Rio Grande and its tributaries; but that "their house continues to be the hut made of bushes." Nothing more satisfactory than this have I been able to get from either Indians or Mexicans.

On Colton's map of North America, however, I notice that Humboldt is made to locate the residence of the Aztecs, in the twelfth century, between the thirty-sixth and thirty-seventh parallels of north latitude, and the one hundred and ninth and one hundred and twelfth meridians of west longitude; but upon what ground the great explorer has based this hypothesis, I know not, for I have not his works at hand to consult. This thing, however, is certain. The ruins I have described were found upon the Rio Chaco. They are evidently, from the simi-



larity of their style and mode of construction, of a common origin. They discover in the materials of which they are composed, as well as in the grandeur of their design and superiority of their workmanship, a condition of architectural excellence beyond the power of the Indians or New Mexicans of the present day to exhibit. And they are all situated between the thirty-sixth and thirty-seventh parallels of north latitude, and near the one hundred and eighth degree of west longitude. It is, then, not at all improbable that they are *the identical ruins to which Humboldt has referred*.

But it may be said, "It is true these remains discover a race of men superior to the natives of New Mexico of the present day; but where are the evidences of the very high stage of civilization to which the Aztecs are said by historians to have attained in Anahuac? Where are the evidences of a mechanical knowledge equal to that which must have been exercised in the construction of the temple of Xochicalco; the palaces of Tezcotzinco; and the colossal calendar stone in the capital?"\* But, waiving the question whether these remains are not of Toltec, rather than of Aztec origin; or of an origin yet more remote; is it at all an impossible thing that a people who could show the ingenuity and skill which the ruins of Chaco attest, could also, self-instructed, by the time of the Spanish conquest, or within the space of three centuries, (the interval between the twelfth and fifteenth centuries,) have made such advances in the mechanic arts as to be equal to the work in question? And still further; is it not very likely that, as history bases the advanced state of the arts among the Aztecs of Anahuac more upon the superior attainments of their predecessors, the Toltecs, and their contemporaries, the Tezcucans,† than upon their own spontaneous, self-instructed efforts; is it not very likely, I say, that, under such favorable auspices, the Aztecs could have attained to the degree of proficiency ascribed to them? The foregoing facts and reflections, it is true, do not with certainty *fix* an Aztec origin to the ruins of the Chaco; but they go to show that, as far as is known, there is nothing to invalidate the hypothesis, but, on the contrary, a great deal to make it probable.

\* Prescott's Conquest of Mexico, vol. 1, pp. 142, 182-185; vol. 2, Ap., part i., note 73.

† Ibid., vol. 3, pp. 215, 216, 414.

Gregg, in his excellent work upon New Mexico, entitled "Commerce of the Prairies,"\* speaking of one of the Chaco ruins, *Pueblo Bonito*, remarks, (most probably from information derived from others,) that it resembles so much those of *Casas Grandes* as to make it probable that they were originally built by the same people; and, as he seems to adopt the idea of the historian *Clavigero*, that these latter *are* of Aztec origin, the inference is that he also attributes the former to the same source. Wislizenus, on the contrary, in his interesting "Memoir of a Tour to Northern Mexico in 1846 and 1847,"† says, (he professes only to speak from report,) that the ruins of *Casas Grandes* are "built of *adobes* and wood squared," and have "a gallery of wood and staircase from the outside." If, then, the information derived by Wislizenus be correct, these ruins cannot be said to resemble those of the Chaco, for the latter are built *entirely of stone*, and, besides, do not discover the *slightest evidences* of ever having had exterior "galleries" or staircases. It is most probable, then, that they are not both of the same, or of Aztec origin. But as, with Mr. Gallatin, I am inclined to doubt the Aztec origin of the former, or those of *Casas Grandes*; so am I equally strong in the opinion that those of the latter, the Chaco ruins, *are* of that origin.

Major Emory also, in his letter to Mr. Gallatin, (to be found in Appendix No. 1 of his "Reconnaissance in New Mexico,") speaking of the ruins on the *Rio Gila*, says: "My own impression is, that the many ruins we saw on the Gila might well be attributed to Indians of the races we saw in New Mexico, and on the Gila itself. I mean by the last, the Pimos, who might easily have lost the art of building *adobe* or mud houses." It would then seem to be very probable that not only were the ruins of the Chaco of Aztec origin; but, as far as has been at present discovered, it is not at all unlikely that they, instead of those on or near the Gila, constituted the last resting-place of this people before entering upon the conquest of Anahuac.

The great historian Robertson, it is said, has stated, (I have not his works near me to verify the fact,) that "there is not, in all the extent of New Spain, any monument or vestige of a building more ancient than the conquest; that the temple of *Cholula*

\* Vol. 1, pp. 283-285.

† Page 59.



is nothing but a mound of solid earth, without any facing, or any steps, covered with grass and shrubs; and that the houses of the people of Mexico are mere huts, built with turf or branches of trees, like those of the rudest Indians."\* However applicable this may be to the ancient remains said to have been found in New Spain—and I have no reason, from my reading, to believe it so—it certainly cannot be predicated of those discovered on the Rio Chaco.

But to proceed with the journal of our route: The last ruins passed, we obtained, from the same eminence on which they are situated, a fine view of the *Tunecha* mountains, situated some forty miles off, to the west; their apparent range being very nearly perpendicular to our course, and the waters of the Chaco (glittering under the rays of an opposite and declining sun) coursing their way, as far as they could be seen, towards them. Already it was 5 o'clock P. M., and no signs of the camp of the troops were visible. Thirteen miles more were made by us—the darkness of the night having come upon us—and still the camp was not in view. Just at this moment, a strange horse neighed directly in front of us. I felt assured that we had at last reached the camp. An exclamation of joy from me was the natural consequence; and I cried out loud enough to get a response from it, if such it was. All, however, was as silent as death. The thought then flashed upon me, we have perchance got into a Navajo snare, and I prepared my firearms accordingly. The sergeant, however, soon ascertained that the horse was an American one, and had a *lariat* (a long halter) upon him. This at once gave me the idea that the camp, if not just at hand, could not be far off. I therefore again gave the word, "Forward." We had, however, not gone more than fifty paces, before I heard a voice calling out, within but a few yards of me, "Simpson! Simpson! come over here." Over an intermediate stream I went, and whom should I find stretched out for a night's repose but Doctor Hammond! It appears that the doctor and Mr. Collins, both of whom had preceded us from the ruins in search of the camp, had, up to this point, not fallen in with it; and the former, believing that it would be better to wait where he was for the troops, and the latter that it was preferable to strike off south

\* See Museum of Foreign Literature and Science, Philadelphia, vol. 7, page 166.

from the river in search of them, they had both acted correspondingly; the doctor spreading out his horse-blanket and overcoat as a pallet for the night; and Mr. Collins taking off with him the two or three Pueblo Indians they had had in company with them. Of course, this accidental meeting was congratulatory on both sides: and particularly fortunate was it for the doctor that he was awake to hail us as we were passing; for, had it been otherwise, his horse, which one of the escort was taking away with him, would have been found missing in the morning, and he, consequently, in rather a helpless plight.

Judging, from the information given me by the guide, that the country admitted of the troops striking the Chaco about two miles lower down, (which, it will be recollected, I was told before leaving camp they would do before encamping,) the doctor consenting to accompany us, we pushed on that distance; but only to be again disappointed. The consequence was that we were obliged to come to a halt and bivouac for the night. Not anticipating anything of this kind when we left the troops, neither Mr. Kern, the doctor, nor myself had brought with us any provisions or bedding. The Mexicans, however, kindly shared their *atole* (a sort of thin mush) with us; and, clubbing our horse-blankets and overcoats together, our saddles serving as pillows, we prepared for ourselves a tolerably comfortable bed.

The whole distance travelled to-day was about twenty-three miles; and, considering the amount of labor we accomplished at the ruins, we look upon our day's work as being considerable.

The soil in the *Cañon de Chaco*, though now very arid, seems to possess the elements of fertility; and, probably, when the ruined pueblos along it were instinct with life, it was cultivated. The water of the Rio Chaco has been gradually increasing in volume in proportion as we descended it. The flora and sylvia have been, as usual, the artemisia and a stunted growth of cedar, the latter here and there sparsely disposed on the table-lands.

*Eleventh camp, August 29.*—All had a good night of it, notwithstanding our untoward circumstances. The Mexicans again, from their little stock, furnished us with a sufficiency to cause us to feel that we had had a breakfast. Believing that we were in advance of the troops, and that, therefore, they would meet us, I determined to wait for them where we were. In the mean time, I examined the geological structure of the rocks forming the en-



closing walls of the cañon. Beginning at the base and proceeding upwards, I found, first, a bed of impure bituminous coal five feet thick; next, a stratum of argillaceous earth twelve feet thick; next, two feet of argillaceous rock of a reddish ferruginous aspect, presenting evidences of induration by heat; and last, forming the crowning rock of the whole, an amorphous yellow sandstone, interstratified with gray argillaceous shale, of about two feet in thickness. Upon the *talus* of the escarpment, I picked up also some fragments of selenite. The formation just described has characterized the country generally ever since we left the *Rio Puerco*.

Between 10 and 11 o'clock A. M., Carravahal, who had gone with my reconnoitering glass up the neighboring *mésa* height to look out for the command, giving a shout, we were at once convinced that some person or persons were approaching. And, sure enough, not many minutes elapsed before we noticed Mr. Collins coming down the cañon with a party of fifteen Indians. He had come to look us up, and supply us with something to eat. Last night, after a hard ride, he had fallen in with the main camp, some ten miles south from the river. *Sandoval*, the Navajo guide with the command, it appeared, had either honestly changed his mind about striking the Rio Chaco, or his intentions had unwittingly been misinterpreted; or he had had in view something sinister. But, be this as it may, we again started off to find the troops at their next camp; our course continuing to be, for the first ten miles, as yesterday, northwest by west, and immediately down the cañon. Having proceeded five and a half miles, we passed a mound, which, the Indians perceiving, they rushed towards in a mass, to provide themselves with some of the red paint, which crops out near its summit. It was not many minutes before they came dashing upon us again, their faces totally coated with paint, and with them a Mexican, having, not only his face, but the sleeves of his shirt, of a deep red color; and soon after I noticed, not only this fellow's entire clothing, but even his mule's head, of this barbarous complexion; the object being, doubtless, to give him the ferocious, bloody look which, in his soul, probably, he felt he could testify in no other way. About this locality were some fresh foot tracks visible, supposed to be those of Navajo spies who had been dogging us. A mile further, we came to a hemispherical mound, fifteen feet

high, and of about fifty feet base. At the base, coal crops out. Immediately above is a blue rock, apparently argillo-calcareous, two feet thick, blackened as if by fire. Above this, and forming the chief covering, is a grayish-white pulverulent mass, intermingled with fragments of red argillaceous rock, also showing marks of heat; and immediately at the apex, or summit, are fragments of the same kind of rock, highly scoriaceous. Is it not reasonable to presume that here has been a slight upheave from below, attended with fusion; indeed, a volcano on a small scale?

Leaving the cañon at a point about ten miles from our place of bivouac, we struck a general course south of west; the country for the next ten miles being a barren waste of broken hills and arid plains, and some of the hills being so steep as to require us to lead our horses down them, and even then at the risk of their limbs; the soil of the plains presenting very much the levity and color of ashes, and looking, if possible, more under a *curse* than the generality of that we have passed over. This distance traversed, we got in the midst of a most singular profusion and confusion of deep, rugged ravines, and high sandstone rocks, of almost every shape and character imaginable. Here were at once to be seen domes, pillars, turrets, pinnacles, spires, castles, vases, tables, pitched roofs, and a number of other objects of a well-defined figurative character, specimens of two of which will be seen in Plate 42. The base of these formations is an argillaceous, friable rock.

At length, reaching the brow of the Tunecha valley, much to our joy, we could see in a direction south of west the camp of the troops, some seven or eight miles off; the tents appearing at times like white specks, and cheering us by the peaceful blue smoke with which they were canopied. The intermediate plain, of an ash-colored, herbless, forbidding character, rapidly traversed, it was not long before we were entering camp, much to the gratification of our comrades, who, it appeared, had felt no little anxiety on our account; and greatly to our own satisfaction.

Our day's travel has been about twenty-nine miles. The water at this camp, of highly alkaline character, is obtained from dug pits. Wood of a shrub or bush character is used for fuel. There being no grass near, fodder is obtained from the green cornfields of the Navajos in the vicinity.

Mr. E. M. Kern having been directed, on my diverging from







R.H.Kern delt.

## NATURAL SAND STONE FORMATIONS.

About six miles east of Camp 11.— Aug. 29<sup>th</sup>

Printed in Colours by P. S. Duval's Steam Lith. Press Philad<sup>a</sup>



the route of the troops, to keep up the topography of the country through which they would pass, the following is his journal for the two days we have been separated:—

“*Tenth camp, August 28.*—Raised camp at 7 o'clock. General course west. About nine miles from our camp of last night, on our left, about three miles distant, appeared the ruins of an old pueblo. The *mésa* that formed the left side of the Cañon de Chaco turns off square opposite the *Mésa Fachada*, and runs in a southerly direction, leaving on our left a plain, slightly broken by gulleys and isolated hills.

“The road to-day has been very interesting on account of the curious sandstone formations, having much the appearance of a large ruined city. These places rendered the road somewhat difficult. Camped to-night at some pools of water, sufficient for the camp. Petrified wood along the river. Made 24.50 miles.

“*Eleventh camp, August 29.*—Moved at 7 o'clock. The artillery, at about three-fourths of a mile, turned a short distance to the left, to avoid a bad ascent of the *mésa*. The country of the same character as of yesterday, but road better. A few uninteresting ruins of old houses in the rocks. Broken bluffs on the right. Camped at some Indian wells. Made 14.60 miles. No vegetation to speak of for the past two days.”

Astronomical observations give for the latitude of this camp  $36^{\circ} 04' 35''$ ; for the longitude,  $108^{\circ} 39' 30''$ .

“*Twelfth camp, August 30.*—Several Navajo men and women were yesterday afternoon and this morning in our last camp. They said the troops had come over sooner than they had expected; that their people were yet living on their cornfields near by; and that they had collected some fifteen horses and mules, and a number of sheep, to deliver up, according to the requirements which the colonel commanding had made of them, through Brevet Major Grier, some weeks previous, at Jémez; that they would conform to the treaty which Colonel Nuby had made with them; did not want to fight, &c.

The women I noticed wore blankets, leggins, and moccasins; the blankets being confined about the waist by a girdle. They bestrode their horses *à la mode des hommes*. One of them, on horseback, had a child at her breast, confined on its back to a

board ; the upper portion canopied by a frame of willow-work, to protect its head from the weather.

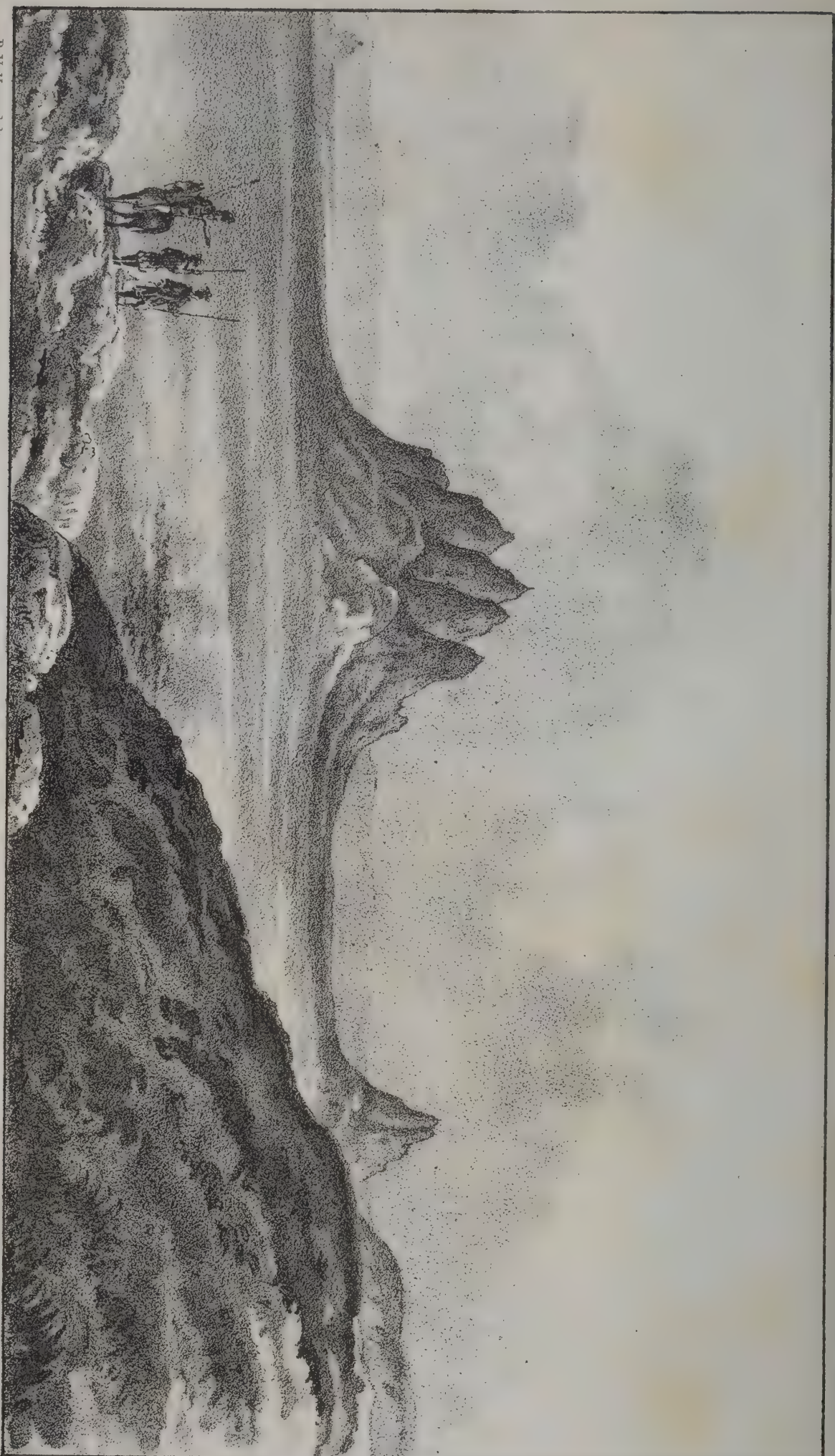
The troops decamped this morning at seven ; their course, which was up the valley of the Tunecha, being generally about northwest. Having proceeded five and a half miles, a most splendid view of the peaks of the Ojos Calientes (Warm Springs) presented itself to our front. This view may be seen in Plate 43 ; several Navajos, in costume, being exhibited in the foreground, gazing at the troops in the distance beyond. These splendid peaks first appeared to view yesterday, from the brow of the Tunecha valley. Two miles further, another body of Navajos appeared in front of us, about a mile distant, who, as we approached, discovered themselves to be mounted. Soon the Pueblo Indians, who were in the advance, were scampering off to commingle with them ; and, dressed as they all were in their costumes, they formed quite an interesting and formidable group. Several of the Navajos, I noticed, wore helmet-shaped caps, which were in some instances heightened in picturesque effect by being set off with a bunch of eagles' feathers.

One of them, I observed, had hair approaching to red, and looked, as was observed by several, very much like a white man painted. Another man, who was quite old, and of very large frame, had a grave and contemplative countenance, not unlike, as many of the officers remarked, (I hope the comparison will be pardoned,) that of General Washington. Some of them were almost naked ; one of them entirely so, excepting his breechcloth ; his whole person at the same time looking ghastly, on account of a kind of whitewash with which it was covered.

Colonel Washington and his staff having remained among the group sufficiently long to enable the main body of the troops to come up, the word was given by him, "Tell Sandoval to direct these people to go forward!" Soon, I could see the whole body of Indians (Pueblos and Navajos) moving in a cloud of dust in advance of us. A dark, portentous cloud was hovering at the time over the Tunecha mountains beyond, the forked lightning ever and anon darting vividly athwart it ; the beautiful peaks of the Ojos Calientes lay quartering to the right ; and in rear could be seen the main command ; first the packs, then the infantry, and last the artillery, (which, on account of some obstacle, had for the moment got behind,) coming forward.







R. H. Kern delt.

P. S. Duval's Steam lith. Press Philad.?

PEAKS OF LOS OJOS CALIENTES,

as seen between Camps II and 12—Aug.



Fifteen miles on our route, we came to a hill, about fifty feet high, up which the artillery was drawn with some difficulty. Six miles further brought us to the Rio Tunecha, (a primary or secondary tributary of the San Juan,) upon which we are now encamped.

The peaks of the Ojos Calientes, as we approached them to-day, appeared very much like ships under full sail; two of them looking very rakish, and the other more upright, as if moved by a gentle breeze.

We passed along the route some very extensive and luxuriant cornfields; the plant looking finer than any I have seen in this country; and what makes it more remarkable, at least in this part of the world, is, there were no evidences of a resort having been had to irrigation. The soil was arenaceous and light; the ears of the plant springing low down from the stalk, and looking sometimes as if they came directly from the soil. Colonel Washington informs me that the latter is probably owing to the deep planting, which the Navajos practice more than other Indians. They plant as deep as a foot or a foot and a half, and he has been assured that they never fail in their crops. This kind of planting, however, I suppose, can only be successful in light, porous soils.

The water in the Rio Tunecha we find amply sufficient and good, and doubtless its constancy may be relied on. The pasture along the stream, however, is but scant, and therefore the cornfields of the Navajos in the vicinity have to be drawn upon. It having been represented that the Navajos would resist the troops in cutting the corn, Captain Dodge, with a command, was sent to enforce the order.

This afternoon, several of the head men of the Navajo tribe have been in camp, and had a talk with Colonel Washington and the Indian agent, Mr. Calhoun; the object of these gentlemen being to inform them that the troops were there in accordance with the determination made known to them some weeks since at Jémez; that, if they did not comply with the treaty made with them by Colonel Nuby, which would require that they should give up all Mexican captives, all murderers of Mexicans who had secreted themselves among them, and all Mexican stock they had driven off since the establishment of the government of the United States over them, the United States would send

among them a body of troops to enforce it. The result of the conference was, that the chiefs present promised to send word out to all the other chiefs, who, they said, would be in camp to-morrow at noon, to hold a council with the United States, and have matters settled.

The latitude of this camp, by observation, is  $36^{\circ} 12' 59''$ ; the longitude,  $108^{\circ} 50' 45''$ .

*Thirteenth camp, August 31.*—To-day, about noon, at our last camp, three Navajo chiefs appeared in council—Narbona, José Largo, and Archulette; when something like the following colloquy took place; the interpreter, Mr. Conkling of Santa Fé, delivering the several points *seriatim*, as they were expressed by Colonel Washington and Mr. Calhoun:—

*Colonel Washington.* Tell them that I wish them to go to Chelly, so that a treaty may be made with the whole nation.

Tell them the treaty I wish to make with them is to establish the conditions they promised yesterday to comply with.

Tell them the treaty I propose to make with them will be based upon the demands I have already made; and the object, in addition, will be a permanent peace.

*Mr. Calhoun.* Tell them they are lawfully in the jurisdiction of the United States, and they must respect that jurisdiction.

*Interpreter.* They say they understand it.

*Mr. Calhoun.* Tell them that, after the treaty is made, their friends will be the friends of the United States, and their enemies the enemies of the United States.

Tell them, when any difficulty occurs between them and any other nation, by appealing to the United States they may get redress.

Are they willing to be at peace with all the friends of the United States?

*Interpreter.* They say they are willing.

*Mr. Calhoun.* Tell them that, by the treaty which it is proposed to make with them, all trade between themselves and other nations will be recognized as under regulations to be prescribed by the United States.

*Colonel Washington.* And the object of this is to prevent their being imposed upon by bad men.

*Interpreter.* They understand it, and are content.

*Mr. Calhoun.* Tell them, if any wrong is done them by a



citizen of the United States, or by a Mexican, he or they shall be punished by the United States as if the wrong had been done by a citizen of the United States, and on a citizen of the United States.

*Interpreter.* They say they understand it, and it is all right.

*Mr. Calhoun.* That the people of the United States shall go in and out of their country without molestation, under such regulations as shall be prescribed by the United States.

*Interpreter.* They say, very well.

*Mr. Calhoun.* Tell them that, by this treaty, the government of the United States is to be recognized as having the right to establish military posts in their country wherever they may think it necessary, in order to the protection of them and their rights.

That the government of the United States claims the right to have their boundaries fixed and marked, so as to prevent any misunderstanding on this point between them and their neighbors.

*Interpreter.* They say they are very glad.

*Mr. Calhoun.* For and in consideration of all this, and a faithful performance of the treaty, the government of the United States will, from time to time, make them presents, such as axes, hoes, and other farming utensils, blankets, &c.

*Interpreter.* They say it is all right.

The several points of the proposed treaty having been explained to the chiefs to their satisfaction, Narbona, the head chief, and José Largo, both very aged—the former about eighty, and the latter about seventy—voluntarily signed powers of attorney, by which full authority was granted to Armijo and Pedro José, two younger chiefs, to act for them at Chelly in the proposed council, in the same manner and to the same extent as they would do were they present.

The council breaking up, Sandoval harangued some two or three hundred Navajos, ranged before him on horseback; the object, as it occurred to me, being to explain to them the views and purposes of the government of the United States. Sandoval himself being habited in his gorgeously colored dress, and all the Navajos as gorgeously decked in red, blue, and white, with rifle erect in hand, the spectacle was very imposing. But soon I perceived there was likely to be some more serious work than

mere talking. It appears it had been ascertained, very satisfactorily, that there was then among the horses in the possession of the Navajos present, one which belonged to a Mexican, a member of Colonel Washington's command. The colonel, particularly as the possessor of it acknowledged it to be stolen, demanded its immediate restoration. The Navajos demurred. He then told them that, unless they restored it immediately, they would be fired into. They replied that the man in whose possession the horse was had fled. Colonel Washington then directed Lieutenant Tores to seize one in reprisal. The Navajos, immediately perceiving it, scampered off at the top of their speed. The guard present were then ordered to fire upon them; the result of which was, that their head chief, Narbona, was shot dead on the spot, and six others (as the Navajos subsequently told us) were mortally wounded. Major Peck also threw among them, very handsomely—much to their terror, when they were afar off, and thought they could with safety relax their flight—a couple of round shot. (See Plate 44, for a sketch of Narbona, taken just before his death—the scourge of the Mexicans, doubtless, for the last half century.)

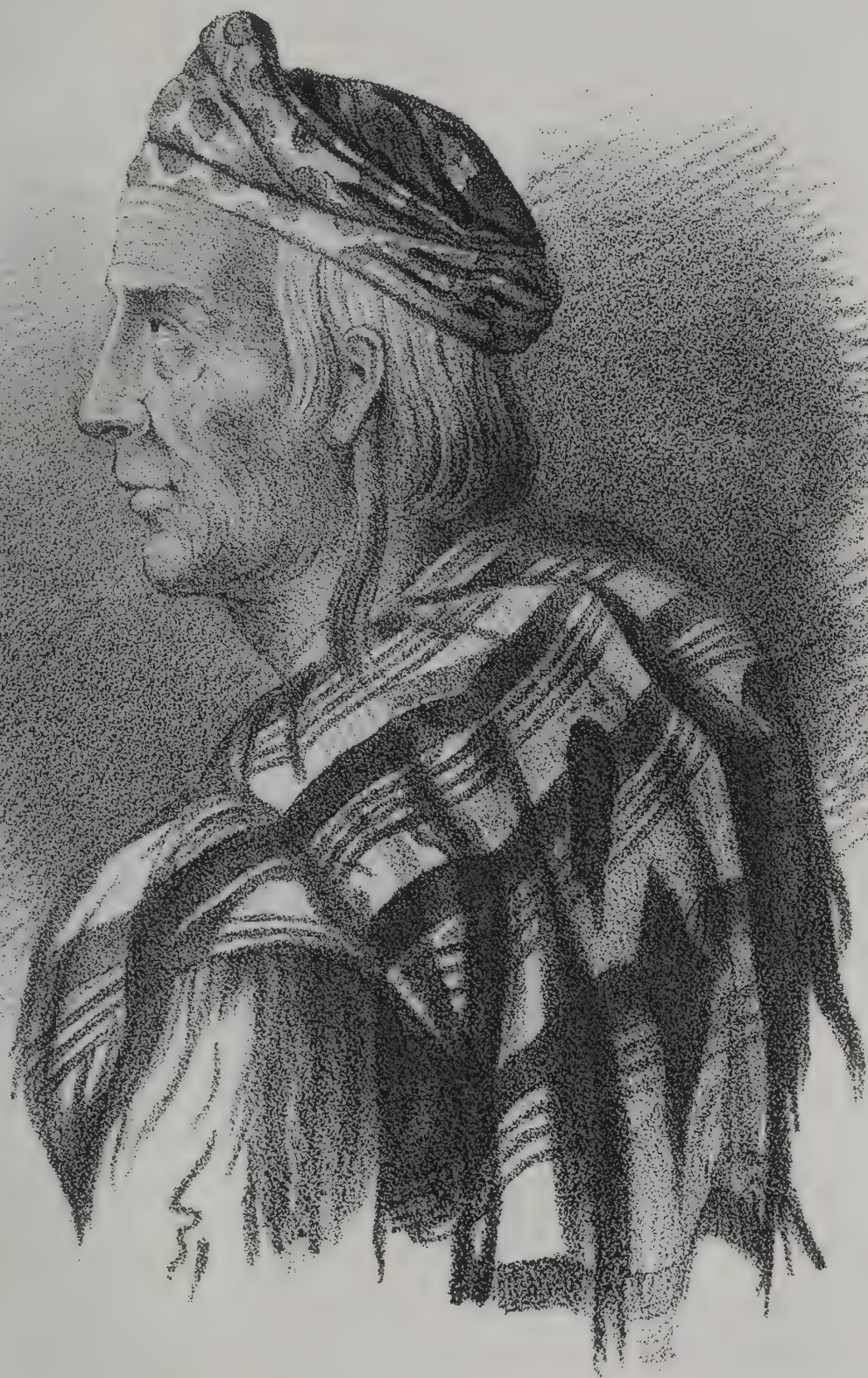
These people evidently gave signs of being tricky and unreliable, and probably never will be chastened into perfect subjection *until troops are stationed immediately among them.*

They had, previous to the affray, during the day, brought in about one hundred head of sheep, and four horses and mules; and immediately after it, some thirty or forty more head of sheep were driven in by the troops.

It is to be regretted that, in the hurry-scurry movement of the enemy, some of the pack animals, which were at the time ready to accompany the troops to the next camping-ground, should have been frightened off.

Immediately after the affair alluded to, at about 5 P. M., the command resumed the line of march. We had not proceeded more than a mile before a Navajo appeared ahead of us, as if anxious to hold a parley. Mr. Conkling was sent forward to see what he wanted. He said he wished to talk to the commanding officer. Colonel Washington told him to come forward. He did so; and, with tears in his eyes, (I do not know how easily these fellows may cry,) he said he did not wish to live any longer among these people; that he wanted peace; that





Drawn by E. M. Kern from a sketch by R. H. Kern.

P. S. Duval's Steam lith. Press Philad<sup>a</sup>

**NARBONA**  
Head Chief of the Navajos.

*Aug. 31<sup>th</sup>*





he was related to Sandoval, and wished to convey his mother to Sandoval's people,\* among whom he desired to live. The colonel told him to go home and keep the peace; that he was at liberty to convey away his mother.

Our march this afternoon was only 4.32 miles. The soil of the valley we have been threading for the last two days, it occurs to me, is (a great deal of it) good, and could doubtless be cultivated much more extensively than it is.

*General character of the country traversed east of the Sierra de Tunecha.*

And now, as we shall commence the ascent to-morrow of the *Sierra de Tunecha*, which traversed, according to the report of one of the guides, is to introduce us into a more fertile region, the opportunity seems to be a favorable one for summing up, in *one general view*, the several characteristics of the country we have been passing through since we left Santa Fé.

The geological features of the country have been, from Santa Fé to the Rio Jémez, an intermixture of primary and secondary mountains, and *mésa* or table-heights, the latter for the most part being overlaid with amygdaloidal trap. From the valley of the Rio de Jémez to where we now are, (or to the *Sierra de Tunecha*,) the formation is entirely of a secondary character; the superior rocks being generally finely (in contradistinction to coarse-grained) argillo-arenaceous—in a few localities exposing out-crops of massive gypsum, selenitic gypsum being found pervading, but sparingly, and bituminous coal, but of an impure, slaty character, characterizing almost continuously this whole section. And commensurate with this section, *arroyos*, *cañons*, *mésas*, with their well-defined crests and escarpments; plateau and hemispherical mounds, intermitting dirty, clay-colored rills, dignified with the name of *rios*, (rivers;) and an all-pervading dull, yellow, dirty, buff-colored soil, have, in their respective magnitudes and relations, characterized the face of the landscape.

In regard to the fertility or productive qualities of the soil for the whole area traversed this side of Santa Fé, saving the

\* Sandoval is the recognized chief of a small number of friendly Navajos living near Cebolletta, on the head-waters of the San José. (See map.)

inconsiderable exceptions which have from time to time been noted in my journal, the country is one extended *naked, barren* waste, sparsely covered with cedar and pine of a scrub growth, and thickly sprinkled with the wild sage, or artemisia, the color of the domestic sage suggesting, very appropriately, the dead, lifeless color of the wild.

Our camp for the night is on a very small rill of good water, in the vicinity of some cornfields, whence, on account of the absence of pasture, we are obliged to draw our forage.

A party of Mexicans and Pueblo Indians which, under the command of Major Kendrick, assisted by Captain Dodge, left camp this morning to reconnoitre the pass of the Tunecha mountains, is still out; and some fears are entertained lest, on account of its being ignorant of the affray this afternoon, it may be surprised, and possibly be taken, at a disadvantage. Sandoval and a party of Mexicans started off this evening to meet it and direct it to camp.

*Fourteenth camp, September 1.*—Major Kendrick got in with a portion of his party late last evening, the horses of the Pueblo Indians being too much broken down to permit them to return with him. We all have some apprehension lest their ignorance of our present relations with the Navajos may unwittingly lead them to give the enemy an advantage over them.

Major Kendrick reports that the Navajo guide who accompanied him was called aside on the way by another Navajo, and doubtless informed of the affair of yesterday. He thinks he must have been made acquainted with it; for on two occasions he endeavored to lead him and his command aside, to give battle to a bear, which, he said, another Navajo had at bay, aside of the route. The Major, however, was not to be diverted from his course, and probably it is very well he was not, for, the guide making his escape soon after, the chances were that his object was to lead them into an ambush.

The Major knew nothing of the commencement of hostilities till he arrived in camp. And, what liked to have proved a very serious affair, he and his party, last night, whilst approaching the camp, were fired upon by the Mexican picket-guard. Captain Dodge was so near one of these valiant fellows as to become unhorsed by his animal suddenly starting aside from the flash of the fellow's musket; and, what was still more unacceptable,



a ball came whizzing by him nearer than he had ever had one before; and, to cap the climax, he afterwards learned that the shot had been made by one of his own company, who happened to be on guard! A soldier was also thrown from his horse by the same cause; and the guide, Carravahal, had his arm grazed by a ball. This vigilant Mexican guard, it seems, had mistaken the major and his party for a body of the enemy! Twice last evening they gave a false alarm!

The troops decamped at 7 A. M.; our course west of south, and the route commencing the ascent of the Tunecha mountains. One mile and a half from camp, we came to a very steep hill, probably about seventy or eighty feet high. The artillery, to overcome this, had to be unlimbered, and all hands were required at the prolonges. The slope of the hill approaching quite nearly the vertical, it would seem that no obstacle, no matter how steep, can obstruct the passage of artillery, where, with adequate human power, and sufficiently strong bricoles, there is present in the officers commanding (as there was here) the necessary energy to secure success. A mile further we crossed an *arroyo* coming in from the mountain, from the banks of which bituminous coal, apparently of an excellent quality, exists in beds of from two to three feet in thickness, with argillaceous shale intervening.

About ten o'clock, the command was cheered with the sight of Hosta and Sandoval, returning with the Pueblo Indians, who had not been able to get into camp last night. They were received with cheers, and Hosta—the handsome, magnanimous Hosta, apparently unconscious of anything distinguishing about him—was greeted with a most cordial welcome. (See him, in his war costume, in Plate 4.) They reported that three of their mules had been stolen by the enemy; but no attack had been made upon them.

Scarcely had the Pueblos joined us, before a couple of the enemies showed themselves, a great distance off, to our front; and, in the *peculiar, far-reaching tone* of the Swiss mountain peasant, in which the Navajos seem to be proficient, made known to us that they wished to have a talk with Sandoval. Sandoval, with Mr. Collins, approaching them, one of them said it was to be regretted that, for so trifling a thing as a horse, so much damage had been done; that by it they had lost one of

their greatest warriors (Narbona); that the people wanted peace, and that they would come in to-day or to-morrow to obtain it. He further remarked that, in the affair of yesterday, he had had a relative shot in the thigh, who might probably die from the wound.

The road to-day up the slope of the Sierra de Tunecha has been very rocky. A few Navajo huts have been seen. These huts are of conical shape, about eight feet high, eighteen feet in diameter at base, and constructed of poles, which, laid against each other at the apex, are spread out to the required diameter at the base, the whole being covered with bark or brush and mud. Yellow pine, about eighty feet high, and twelve feet in circumference at the trunk, as also some scrub oak—the first we have seen—grow along the route.

Flankers were thrown out to-day on either side, to flush any way-layers that might be along the route. Our day's march has been about ten miles. Our encampment is near a pond of excellent water, margined with fine grass; and, being shaded by some noble pines, and a very pretty wide-spreading oak adding its variety to the landscape, the combination makes up the most refreshing picture we have seen during the expedition.

This camp is found to be in latitude  $36^{\circ} 7' 42''$ ; in longitude,  $108^{\circ} 54' 15''$ .

*Fifteenth camp, September 2.*—A sentinel fired during the night at an Indian, as he says, prowling about camp on horse-back. The troops resumed the march at 7 A. M.; the general course west of south. Three miles on the route, we passed on our right a fine pond of water, bordered by a margin of good grass. A mile further brought us to a small streamlet, which, taking its rise in the pass of the mountain, flows eastwardly, doubtless to join the Rio de Tunecha. At this stream the troops were commanded to halt, in order to make the proper preparations for a successful passage through the gorge or gate of the mountain.

Major Kendrick, who, day before yesterday, with a party, had reconnoitered the pass, having represented it as being very difficult, both on account of the obstacles in the way to the passage of artillery and the commanding heights on either side of it, it was believed that here, if anywhere, the enemy would, in a body, make a stand to dispute our advance. The artillery were







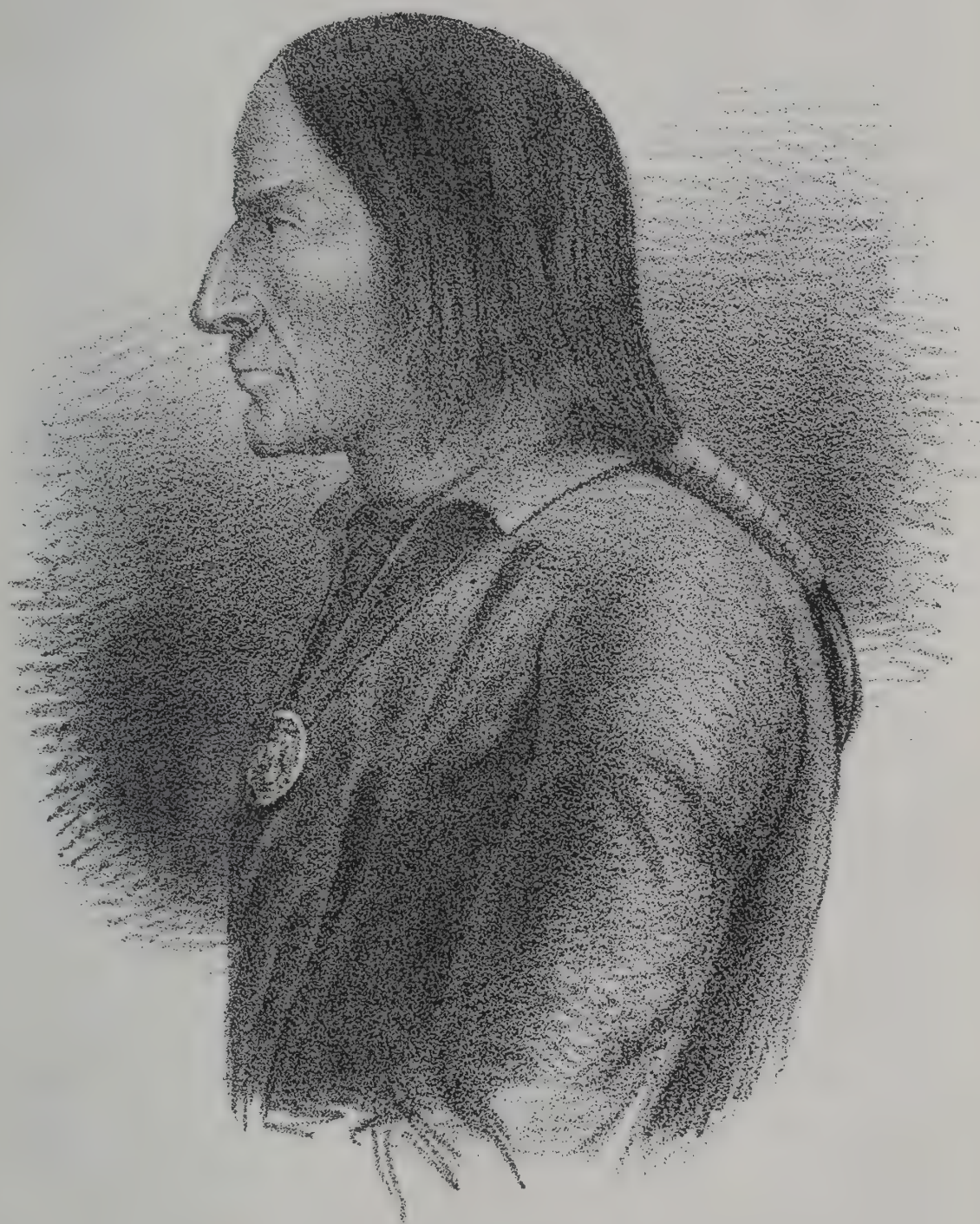
H. H. Kern del.

PASS WASHINGTON, TUNE-CHA MOUNTAINS.

Sept. 21<sup>st</sup>

P. S. Duval's Steam Lith. Press, Philad.





Drawn by E. M. Kern from a sketch by R. H. Kern

P. S. Duval's Steam lith. Press Philad<sup>a</sup>

OW-TE-WA

(Captain)

Ex Gouvernor of Santa Ana.





accordingly placed in a position to cover the passage of our troops; and forty Pueblos, under their elected chief *Ow-te-wa*, (see Plate 13)—Captain Dodge voluntarily offering to lead them—were pushed forward in advance, with directions to scale and take post on the heights to the right of the defile. I had noticed with my reconnoitering glass several of the enemy upon the heights, to the left of the defile; and it was not at all improbable that they were strongly posted on the still more commanding heights on the right. The Pueblo Indians having gallantly gained the heights, and met no enemy, a preconcerted signal (the firing of a rifle) was given, to inform the commanding colonel of the fact. The infantry were then ordered to move forward, a portion of them being at the same time directed to scour the more accessible heights commanding the pass on the left. Soon after, the whole command was put in motion; the packs in the centre, and the artillery bringing up the rear.

The pass at the most dangerous point we found extraordinarily formidable. On the north side is a wall of trap, capped with sandstone, running perpendicularly up, from the bottom of the defile to a height of about six hundred feet; and in addition to this, there are two others, but further removed. On the left side is another height, running up from the defile, with an accessible slope, to a height of probably about three hundred feet. The width of the pass at this point is probably not more than fifty feet, and barely furnishes a passage-way (a sideling one at this) for the artillery. This, the most difficult portion of the pass, is probably about three hundred yards long. Colonel Washington informs me it is the most formidable defile he has ever seen. The artillery were three hours in getting through it. In honor of the colonel commanding, I have, on my map, called it Pass Washington. (See Plate 45 for a view of it, looking back.)

The narrow portion of the pass got through, it immediately expands into one of about a quarter of a mile in breadth, and which, for this country, is of extraordinary beauty. The soil here is of a very rich quality. The pines are tall and large, the grass luxuriant, and the surface of the ground, which is sweetly undulating, is covered with a profusion of the most beautiful and delicate flowers; the wild rose, the first I have seen during the expedition, being among them. A stream of pure wholesome water, trickling along through this scene, westward, adds its

beauty to the picture. It is in the midst of a landscape like this, about three-fourths of a mile from the narrowest portion of the gorge, we are encamped.

The rocks about the pass are at base a dark-green trap overlaid by sandstone. A late work, entitled "Doniphan's Expedition," represents the Sierra de Tunecha as "the grandest of mountains, consisting of large masses of granite piled on granite, and penetrating into the region of clouds and permanent snows."\* In crossing the ridge, we discovered no granite; and neither remotely, when observing the heights from the plains, nor when near by them, could we perceive the slightest indications of snow.

It is observable that troops attempting to pass the defile from the *east* side of the mountain will find a subordinate eminence, to the west of the point where it was stated the battery was established to cover the movement, upon which a battery could be placed which would be in effective range of the heights commanding the pass on either side.

Captain Dodge informs me that, before the Pueblos reached the heights they were ordered to scale, they halted on the way to receive from their chiefs some medicine from the medicine-bags which each of them carried about his person. This they rubbed upon their heart, as they said, to make it big and brave; and they also rubbed it on other parts of their bodies, and upon their rifles, for the same purpose.

The distance marched to-day is estimated at six miles. For the past two days, on account of the roughness of the route and consequent fear of damage, the adometer has been detached from the wheel of the six-pounder. It was quite apparent that the route we have come is practicable for wagons only *as far as the east base of these mountains*.

A very pretty stone, between the jasper and chalcedony, has been found strewed over the ground at this and our last encampment. A grizzly bear, it is reported, has been seen near our present camp. The whole command has been in the most buoyant spirits ever since we commenced the ascent of the Sierra de Tunecha; the air, the water, and the scenery all doubtlessly contributing their joint influence.



*Sixteenth camp, September 3.*—Carravahal representing that there yet remained a very narrow and difficult defile to pass through before we should be entirely extricated from the natural defiles of the route, I was ordered this morning by the colonel commanding in advance, (thirty Pueblos and Lieutenant Tores accompanying me,) to reconnoitre. After getting about half a mile from the camp, we entered a gorge, which, for about a mile, we found very narrow, and commanded by heights on either side. These heights, however, are easily accessible, and can be swept by troops thrown out as flankers. The very narrowest portion of the gorge extends only for about one-third of a mile. The artillery were detained here, on account of obstacles, three-quarters of an hour, and also slightly in crossing the *Rio Negro*, which they did twice subsequently. This stream, which is the one spoken of as passing through our camp of yesterday, and taking its rise in the pass, is a beautiful mountain brook, and, coursing generally south of west, probably runs into the Cañon de Chelly.

The gorge we found to-day, as yesterday, surpassingly beautiful. Primary mountain heights extend on either hand for the first three miles, and then the secondary commence. Four miles further, the gorge expands indefinitely to the right and left, the greatest elevation of the heights on either side being probably about eight hundred feet.

The soil of the valley of the *Rio Negro* is exceedingly rich. Among the *sylva*, I noticed towering pines and firs; also the oak, the aspen, and the willow; and bordering the stream was a great variety of shrubbery, the hop vine, loaded with its fruit, being intertwined among them. Flowers of rich profusion, and of every hue and delicacy, were also constantly before the eye—upwards of ninety varieties having been picked up since we entered the gorge yesterday. Indeed, we are all in hopes that, yesterday and to-day, we have been having an earnest of what we may yet behold in this part of the world—a rich, well-timbered, and sufficiently-watered country, *a thing I have not seen since I left the confines of the United States.*

Our march to-day is estimated at twelve miles, and we are encamped upon the Sieneguilla Chicita, (Little Meadow,) near the *Rio Negro*, a locality which furnishes good water and grass; and near at hand is an abundance of the *artemisia*, which answers

very well for fuel. For a view of the Sienuilla from the west face of the mountain, see Plate 46. Its soil is very rich.

Carravahal informs me that the Governor of New Mexico, some years since, attempted to make his way into the Navajo country through the pass we have been threading, and was driven back.

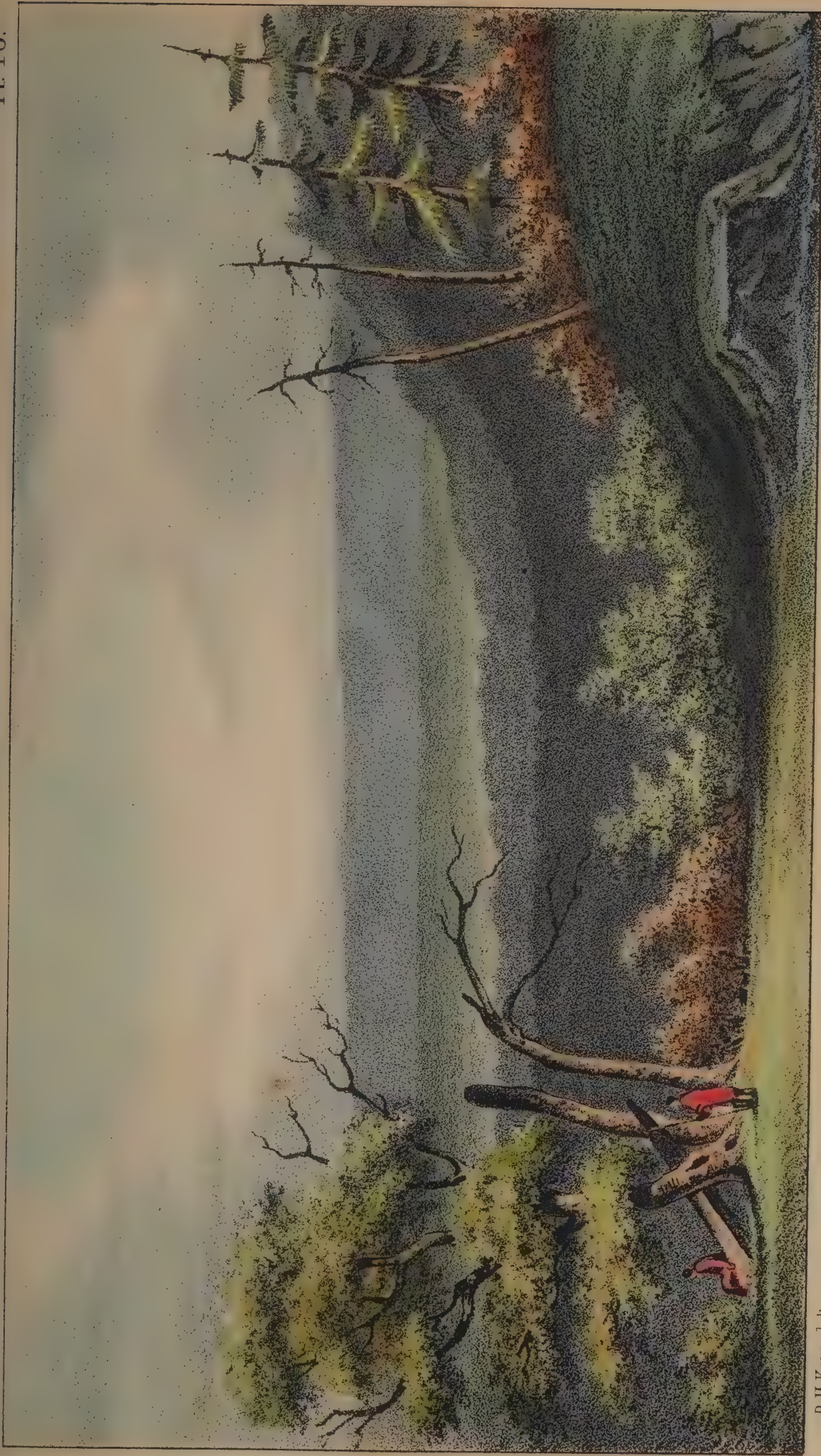
Gregg also, in his "Commerce of the Prairies," probably refers to the same pass in the following passage:—

"Towards the close of 1835, a volunteer corps, which most of the leading men in New Mexico joined, was raised for the purpose of carrying war into the territory of the Navajos. The latter, hearing of their approach, and anxious no doubt to save them the trouble of so long a journey, mustered a select band of their warriors, who went forth to intercept the invaders in a mountain pass, where they lay concealed in an ambuscade. The valiant corps, utterly unconscious of the reception that awaited them, soon came jogging along, in scattered groups, indulging in every kind of boisterous mirth; when the war-whoop, loud and shrill, followed by several shots, threw them all into a state of speechless consternation. Some tumbled off their horses with fright; others fired their muskets at random; a terrific panic had seized everybody; and some minutes elapsed before they could recover their senses sufficiently to betake themselves to their heels. Two or three persons were killed in this ridiculous engagement—the most conspicuous of whom was a Captain Hinófos, who commanded the regular troops."\*

Hosta, to-day, has been treating us again with some more of his traditionary lore. The French (so *he* says) once attempted to subdue the aboriginal Mexicans, and failed. The Spaniards then came, and succeeded. The latter began to brag of their guns, by which they had accomplished the conquest. Montezuma, hearing of it, said they had no reason to do this, for he could bring a bigger gun than they could. "Why, what can your gun do?" remarked he to the Spaniards. "It can make a hole through a tree," was the reply. "Well," says Montezuma, "mine can split a tree from top to bottom. Now, show me what yours can do." So the Spaniards shot at a tree and made a hole in it. Montezuma, seeing this, then called down his thunder from the clouds and shivered it from top to bottom!

\* Pages 288, 289.





R. H. Kern delt.

## THE CIENEGUILLA CHIQUITA,

from the west face of the Tune-cha Mountains, Sept. 3.

P. S. Duval's Steam Lith. Press Philad<sup>a</sup>.









R. H. Kern delt.

## TRAP DYKE,

between camps 16 and 17.—Sept.

P. S. Duval's Steam Lith. Press Philad.?



A series of astronomical observations make the latitude of this camp  $36^{\circ} 2' 7''$ ; its longitude,  $109^{\circ} 5' 45''$ .

*Seventeenth camp, September 4.*—The weather, during the nights, ever since we left the Puerco, has been quite cold; during the day, on the contrary, it has been generally pleasantly warm—occasionally very warm.

Four Navajos had a talk with Sandoval outside the line of sentinels this morning. Subsequently, four more came to the conference. They all, however, being unimportant men, nothing came out of it.

Our route to-day, more winding than usual, has been generally west of north. The distance marched was 13.43 miles. For the first half of the distance, the *Sierra Rayada* was immediately on our left; and throughout the whole of it, the *Sierra de Sieneguilla* was immediately on our right. These mountains are of a basaltic trap character, in some instances resembling very much the palisades on the Hudson River. This trap is apparently the effect of protrusion, rather than of overflow, and is more irregular in its outlines than that I have already noticed as characterizing the country west of the Rio de Jémez.

At about six miles from our last camp, immediately on the right of the road, I observed a well-marked dike of trap rock, its course being north of east and it leaning slightly towards the north. It exhibits itself in an outcrop of detached blades, some of them being from thirty to forty feet above the plain, and about three feet thick. (See sketch in Plate 47.) The soil from which it projects is of a reddish, argillaceous character. This outcrop, it is obvious, must have been the effect of protrusion from below, and at a time when there were rocks against it to prevent an overflow; and these adjacent formations must since have been either decomposed or have sunk.

About half a mile further, we crossed a shallow stream of very good water, running southwestwardly, good grazing being apparent along it. Seven and a half miles from our last camp, we passed on our left a very rich field of wheat, the stalks averaging five and a half feet high, the heads very full, and the grains plump and large. A mile and a half further, another streamlet comes in from the northeast and crosses the route. I noticed, also, in the vicinity of this stream, some good grazing.

Ten miles from our last camp, we met a very steep, rocky ascent

of about fifty feet in altitude, where the men had to assist at the guns. A mile further brought us to the *Sieneguilla de Juanita*, (Little John's Meadow,) the soil of which, of considerable area, and of a rich mellow calcareo-argillaceous character, looks as if it might produce well. Ligneous petrifications, and carbonate of lime, in lamellar pieces, of a satin aspect, in fracture, probably the result of tufaceous deposit, lie scattered over the surface. I noticed, also, a great deal of horse ordure lying about; it indicating that the *Sieneguilla* is a favorite resort for these animals. Running through the *Sieneguilla*, in a southerly direction, and probably into the Cañon de Chelly, is the *Rio de Juanita*, a stream of a sandy bottom, fifty feet wide, and of a few inches in depth, upon which we are encamped. The water of this stream, which is probably constant, is good; and the neighborhood furnishes proper grass and fuel.

The *sylva*, to-day, has been the large yellow pine and the piñon—willows fringing, in places, the streams. Signs of large droves of sheep have been noticed. Prairie dog towns, and rattlesnakes, their concomitants, though not so common as on the great plains intermediate between the United States and this country, are occasionally to be met with. Just before reaching camp, we crossed a well-beaten Navajo trail, running north and south.

It is very interesting to see the picket-guard, composed entirely of *Pueblos*, gathered around the commanding officer's tent every evening, to receive from him their instructions for the night. Habited as they are, with their blankets thrown around them, their *white* turbans (assumed to distinguish them from the enemy, who generally wear *red*) encircling their heads, their rifles lying in their arms, or their bows and quivers slung to their backs, their attitude that of respectful attention, they present a group of a very interesting character. These people possess a great deal of native ease and dignity; and in their calm, reflective countenances, I think I can perceive a latent energy and power, which it requires only a proper political and social condition to develop and make useful.

Some more Navajos (uninfluential men) have had a talk this afternoon with Sandoval, outside the line of sentinels. The word is, as usual, that they want peace; but the official persons, the chiefs, not presenting themselves to obtain it, the colonel commanding is determined to push on to Chelly, the heart of their









R.H. Kern del.

VIEW OF THE CANON OF CHELLY NEAR ITS HEAD,  
five miles south west of Camp 17 -- Sept. 5<sup>th</sup>.

P.S. Duval's Steam Lith. press, Phil.



country, and dictate the terms there. Besides, according to his original design, he is anxious to meet Captain Ker, who, with his command, from information obtained from a chief at the last council, he is disposed to think must have pushed on to that place.

The resulting latitude of this camp, from a series of observations, is  $36^{\circ} 10' 36''$ ; the longitude,  $109^{\circ} 12' 15''$ .

*Eighteenth camp, September 5.*—This morning, a party, composed of Colonel Washington, Mr. Calhoun, Mr. Collins, Major Kendrick, Lieutenant Dickerson, the two brothers Kern, and myself, visited the head of the renowned Cañon of Chelly, lying southwest about five miles distant from our last camp. This cañon has been for a long time of distinguished reputation among the Mexicans, on account of its great depth and impregnability—the latter being not more due to its inaccessibility than to the fort which it is said to contain. This fort, according to Carra-vahal, is so high as to require fifteen ladders to scale it; seven of which, as he says, on one occasion, he ascended; but, not being permitted to go higher, he did not see the top of it.

On reaching the cañon, we found it to more than meet our expectations—so deep did it appear, so precipitous its rocks, and so beautiful and regular the stratification. Its probable depth I estimate at about eight hundred feet. At its bottom a stream of water could be seen winding its way along it, the great depth causing it to appear like a mere riband. (See sketch in Plate 48.)

As far as time would permit an examination, for a depth of about three hundred feet—I could descend no further, on account of the wall becoming vertical—the formation appeared to be sandstone, horizontally stratified with drift conglomerate. At this depth, I found protruding horizontally from the wall, its end only sticking out, a petrified tree of about a foot in diameter, a fragment of which I broke off as a specimen. How did this tree get there? I also picked up at this point, upon the shelf on which I was standing, a species of iron ore, probably red hematite. The colonel commanding returning to camp, after a cursory look at the cañon, in order to put the troops in motion for the day's march, I had not the time necessary to make the full examination which I would have liked. I saw, however, enough to assure me that this cañon is not more worthy of the attention of the lover of nature than it is of the mineralogist and geologist. The

whole party returned to camp greatly pleased with this offset excursion, and promise themselves still greater delight when, on their reaching the mouth of the cañon, they will have more time to examine it.

In consequence of the excursion this morning, the troops did not move till about 9. Our course for the day was generally west of north. Two and a half miles from our last camp, we passed on our right a cylindrical mass of trap rock protruding from the summit of the mountain ridge, the outcrop being probably as much as one hundred and fifty feet high. This singular landmark was seen yesterday before reaching camp. Two and a half miles further can be seen, also, immediately on the right of the road, a dike of trap rock ranging very nearly east and west, its eastern terminus of the form of a semi-conical abutment, about five hundred feet in protrusion from the plain below. A portion of this dike is perfectly columnar in its details.

Five and a half miles on our route, we reached the brow of a valley running generally north and south, it being apparently hemmed in at the north, nearest to us, by a range of secondary mountains, and further off by *mésa* heights. The former are of rounded form, and on account of their white ground being sprinkled with the evergreen cedar, have a motley aspect. The latter present a beautiful façade-like appearance, and are of a deep red color. The intervening valley, on account of the copse-like character of its *sylva*, in contrast with the barren wastes which we traversed on the east side of the Tunecha ridge, was very refreshing to us.

Having marched 7.39 miles, we came to the creek upon which we are encamped. This creek is a clear stream of good water, ten feet wide by half a foot deep, coursing west of south, over a clean and pebbly bottom, and presenting here and there rapids and cascades as delightful to the eye as they are rare in the country. Upon its margin we find a sufficiency of grass for our animals.

The road to-day has been generally good, there having been but two steep hills, which detained the artillery but a short while. The soil has been of an argillaceous character, and in the valleys always appeared to be fertile; the timber, which has been pine and cedar, of a large growth; a few large oaks were



also seen. The *artemisia*, as usual, has been the chief, and almost the only plant, especially upon the uplands.

Twenty-five Mexicans were sent out this afternoon to examine, with Carravahal, the river ahead for a few miles. They had not proceeded, however, more than a mile, when, seeing three or four of the enemy, their hearts failed them, and they returned to camp. Some Pueblos were then added to the party, and the whole put under the charge of Lieutenant Tores. The party returned at about dusk, and report the road good for eight miles, excepting one steep hill, which, however, Lieutenant T. thinks practicable.

*Nineteenth camp, Chelly, September 6.*—The troops decamped at 6 this morning—an hour earlier than usual, on account of an anticipated long march without water. Our route, though curving considerably towards the north, has been generally a little south of west.

At the respective distances of six and a half, twelve, thirteen, thirteen and a half, sixteen and a half, sixteen and three-quarters, and eighteen miles, we crossed some deep rocky *arroyos*, the first detaining the artillery three-quarters of an hour, the fourth three-quarters of an hour, and the last an hour. The artillery to-day have been obliged to work harder than they have done any day since they started on the expedition. They, however, appear to be equal to any emergency, and, though detained, at times, necessarily, on account of difficulties, they are always sure to be getting along in due time. The infantry, under Captain Sykes, from the commencement of the march, have constantly preserved a compact, effective form, and have ever appeared as a *unit*, to be wielded by their leaders with precision and power.

The country to-day has been rolling—almost, indeed, broken belts and clusters of trees, and sometimes solitary ones, diversifying its face. Piñon, yellow pine, and cedar have been the *sylva*—acres of the latter occasionally being dead; the cause not obvious. The *artemisia* has been the chief *flora*. The cactus, which hitherto has been seen but seldom, to-day was more prevalent.

When two miles on our route, looking back, a fine view presented itself, made up of mountains, beautifully variant in outline; prominent peaks here and there in the background; and,

intermediate between them and myself, the troops—horsemen, footmen, and artillery—their arms glittering under the glancing rays of a morning sun, and a cloud of dust betokening their approach.

A mile and a half further, some beautiful red bastion-like rocks appeared, two miles distant, on our right, capped with a whitish amorphous formation. Fifteen miles from our last camp, on our right, we noticed two very singular *mésa* formations, one of them looking like a high, square fort, and discovering, by the daylight which could be seen through it, the appearance of a tunnel running horizontally through and through.

Though not expecting to find water along the way, thirteen and a half miles from our last camp we met some, in deep pools, in a rocky *arroyo* which we crossed. Here may be seen some singular-shaped basins and arches, all the effect of the erosive influence of water upon sandstone formation.

Innumerable signs of stock, principally of sheep, have been seen along the route ; and the road we have been travelling looks as if it might be one of the great thoroughfares of the nation.

One of the pack animals to-day falling too far in the rear of the main body of the command, the soldier in charge, seeing a Navajo near, and at the same time a dust in rear, as if made by a host of the enemy approaching, thought that discretion was the better part of valor, and, leaving his pack, fled. The force in rear, however, proving to be the Mexican cavalry, and Lieutenant Dickerson happening at the time to be with them, he directed a chase after the Navajo, who by this time had got possession of the pack animal, and was appropriating the contents of its pack to himself. Lieutenant Dickerson informs me that he got five distinct shots at the fellow with his revolver, and, though he was not able to bring him to a surrender, was, nevertheless, successful in causing him to leave the animal and his pack.

It was somewhat exciting to observe, as we approached the valley of *Chelly*, the huts of the enemy, one after another, springing up into smoke and flame, and their owners scampering off in flight.

Just after dark, after crossing an extensive *down* or sand drift, we reached our camping-ground, in the valley of *Chelly*; and, much to our disappointment, after a hard day's march of 26.45







Drawn by E. M. Kern from a sketch by R. H. Kern.

P. S. Duval's Steam lith. Press Philad.<sup>a</sup>

MARIANO MARTINEZ

Chief of the Navajo Indians

Sept 8<sup>th</sup>



miles, we are obliged to spend the night without water. The cornfields among which we are encamped furnish, however, an abundance of forage for the animals, and fine roasting-ears for the men; but the great beverage of the soldier in his marches—coffee—will, in most instances, have to be dispensed with.

*Nineteenth camp, Chelly, September 7.*—The fires of our camp were all, yesterday, at dark, from motives of military expediency, extinguished—a phenomenon which doubtless was not without its moral effect upon the enemy, who are hovering around us.

This morning a couple of Navajos—one of them a chief—were brought into camp by Sandoval, both of them embracing Colonel Washington and Mr. Calhoun, apparently, with a great deal of good-will. The chief, whose name is *Mariano Martinez*—habited as he was in a sky-blue-blanket greatcoat, apparently of American manufacture, and not unlike my own; a tarpaulin hat, of rather narrow brim, and semispherical crown; buckskin leggins and moccasins; bow and quiver slung about him; a pouch and knife at his side; and possessing a sombre cast of countenance, which seemed to indicate energy and perseverance combined—appeared like a man who had naturally risen up by virtue of the energy of his character, and, from the effects of a marauding life upon a civilized community, had become impressed with the Jacobin look which he at the time discovered. (See a sketch of this chief in Plate 49.) The conversation which passed between these chiefs and the colonel commanding was as follows:—

*Colonel Washington.* Who is this man? (referring to Martinez.)

*Interpreter.* He is the principal chief of the Navajos.

*Colonel Washington.* Tell him, when a chief wishes to talk with me, by making known his intentions by a white flag, he will be conducted safely into camp; but that everybody else must keep a mile off, or else be liable to be shot.

Are he and his people desirous of peace?

*Interpreter.* He says they are.

*Colonel Washington.* Tell them, if they are, they can easily obtain it by complying with the terms of the treaty which they have made, and that the sooner they do comply with them the better it will be for them, as less of their property will be wasted and destroyed.

*Interpreter.* His reply is, that they will bring in all they have stolen, and comply with the treaty.

*Colonel Washington.* Mr. Collins, where is the list of the property to be restored under the treaty?

*Mr. Collins.* Here it is, sir.

*Colonel Washington.* Add to it that which has been stolen from us on the march.

*Mr. Collins.* Here it is, sir, with the additions made.

*Colonel Washington.* Tell the chief the stolen property which the nation is required to restore is 1,070 head of sheep, 34 head of mules, 19 head of horses, and 78 head of cattle.

*Interpreter.* The cattle, the chief says, he knows nothing about; the Apaches must have stolen them.

*Colonel Washington.* Tell him that, if this should afterwards prove to be true, the cattle will be paid for.

*Interpreter.* He says, if he cannot bring in the same cattle, he will bring in others to supply their place.

*Colonel Washington.* When can the chiefs collect here to make a treaty with me?

*Interpreter.* He says the day after to-morrow.

*Colonel Washington.* Tell him that will do; and that, when the treaty is made with them, all the property the troops have taken, they will be compensated for. And there was one more thing he would say: that, if they now entered into a treaty with him in good faith, it would result in blessings upon him and his people; but, if they did not, it would result in their destruction.

*Interpreter.* The chief replies that his people will do all he has promised.

*Colonel Washington.* Tell him the talk is good.

The conference ended, the chief and his attendant, *à la mode Mexicaine*, again embraced Colonel Washington and Mr. Calhoun very impressively, and apparently with much *endearment*.

To-day, by digging several pits five feet deep in the arroyo of the valley, a sufficient supply of good water has been obtained for the camp.

The latitude of this camp, by a series of astronomical observations, is found to be  $36^{\circ} 9' 4''$ ; its longitude,  $109^{\circ} 42' 30''$ .

*Nineteenth camp, Chelly, September 8.*—Early this morning, a Mexican captive, of about 30 years of age, came into camp



to see the colonel commanding. He represented that he was stolen by the Navajos seventeen years ago, and that he did not now wish to be restored to his people again. Indeed, he did not as much as ask about his friends, who, I am informed, are now living at Santa Fé—from the vicinity of which he was stolen, whilst tending sheep. He is a very active, intelligent-looking fellow, and speaks like a native-born Navajo—having all their characteristics, in dress, conversation, and manners.

Agreeably to the orders of the colonel commanding, I left camp at 7½ o'clock this morning to make a *reconnaissance* of the renowned Cañon of Chelly. In addition to my assistants, the two Kerns and Mr. Champlin, there were in company an escort of about 60 men—Brevet Major Kendrick being in command, assisted by Captain Dodge. Lieutenants Ward, Dickerson, Jackson, and Brown, as also Assistant Surgeon Hammond and Mr. Collins, accompanied the party. Our course for nearly two miles, as far as the mouth of the cañon, was east of south, and up the valley of Chelly. The soil of this valley, which is generally very sandy, is in spots quite fertile—on an average, a belt of probably half a mile in breadth being planted in corn. The cane, also, I noticed growing very luxuriantly in places. The whole breadth of this valley is about three miles.

Reaching the mouth of the Cañon of Chelly, we turned to the left to go up it. Its escarpment walls at the mouth we found low. Its bottom, which in places is as little as one hundred and fifty feet wide, though generally as wide as three or four hundred feet, is a heavy sand. The escarpment walls, which are a red amorphous sandstone, are rather friable, and show imperfect seams of stratification; the dip being slight, and towards the west.

Proceeding up the *cañon*, the walls gradually attain a higher altitude, till, at about three miles from the mouth, they begin to assume a stupendous appearance. Almost perfectly vertical, they look as if they had been chiselled by the hand of art; and occasionally cirrous marks, apparently the effect of the rotary attrition of contiguous masses, could be seen on their faces.

At the point mentioned, we followed up a left-hand branch of the cañon; this branch being from one hundred and fifty to two hundred yards wide, and the enclosing walls continuing stupen-

dous. Two or three patches of corn, intermingled with melons, pumpkins, and squashes, were met with on the way.

Half a mile up this branch, we turned to the right, up a secondary branch, the width of which was rather narrow. This branch shows rocks, probably as high as three hundred feet, almost perfectly vertical, and in some instances not discovering a seam in their faces from top to bottom. About half a mile up this branch, in the right-hand escarpment wall, is a hemispherical cave, canopied by some stupendous rocks; a small, cool, acceptable spring being sheltered by it. A few yards further, this branch terminates in an almost vertical wall, affording no pathway for the ascent or descent of troops. At the head of this branch, I noticed two or three hackberry-trees, and also the *stramonium*, the first plant of the kind we have seen.

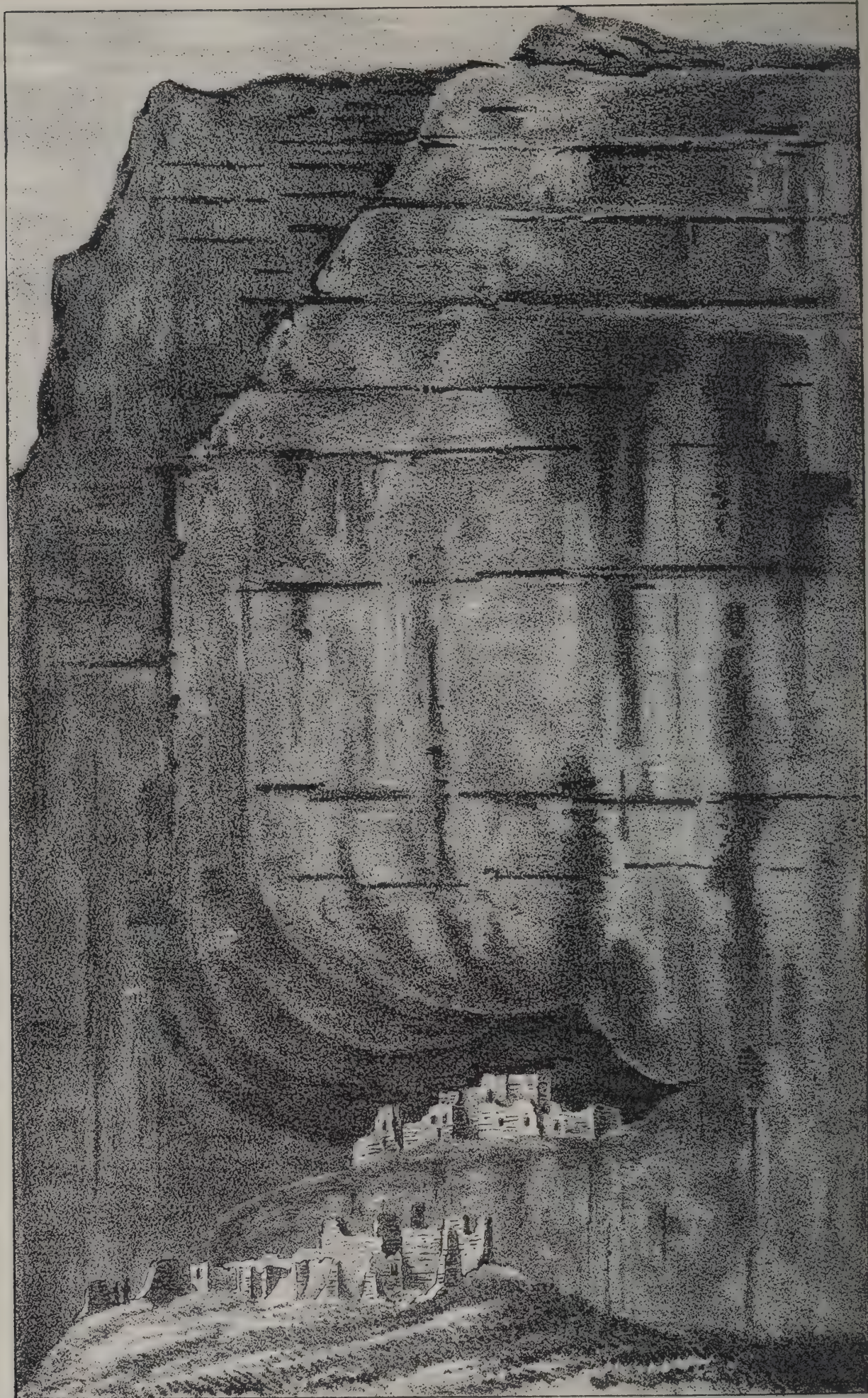
Retracing our steps to the primary branch we had left, we followed it up to its head, which we found but two or three hundred yards above the fork, the side walls still continuing stupendous, and some fine caves being visible here and there within them. I also noticed here some small habitations, made up of natural overhanging rock, and artificial walls, laid in stone and mortar; the latter forming the front portion of the dwelling.

Having got as far up the lateral branches as we could go, and not yet having seen the *famous* fort, we began to believe that, in all probability, it would turn out to be a fable. But still, we did not know what the main cañon might yet unfold, and so we returned to explore it above the point or fork at which we had left it. Starting from this point, our general course lay about southeast by east. Half a mile further, or three and a half miles from the mouth of the cañon, on its left escarpment, I noticed a shelving place where troops (but not pack animals) could ascend and descend. Less than a mile further, I observed, upon a shelf in the left-hand wall, some fifty feet above the bottom of the cañon—unapproachable except by ladders, the wall below being very nearly vertical—a small pueblo ruin, of a style of structure similar, to all appearances, to that found in the ruins on the Chaco. I also noticed in it a circular wall, which, in all probability, has been an estuffa. The width of the cañon at this point is probably from two to three hundred yards wide, the bottom continuing sandy and level. And, what appears to be singular, the sides of the lateral walls are not only as vertical as natural walls







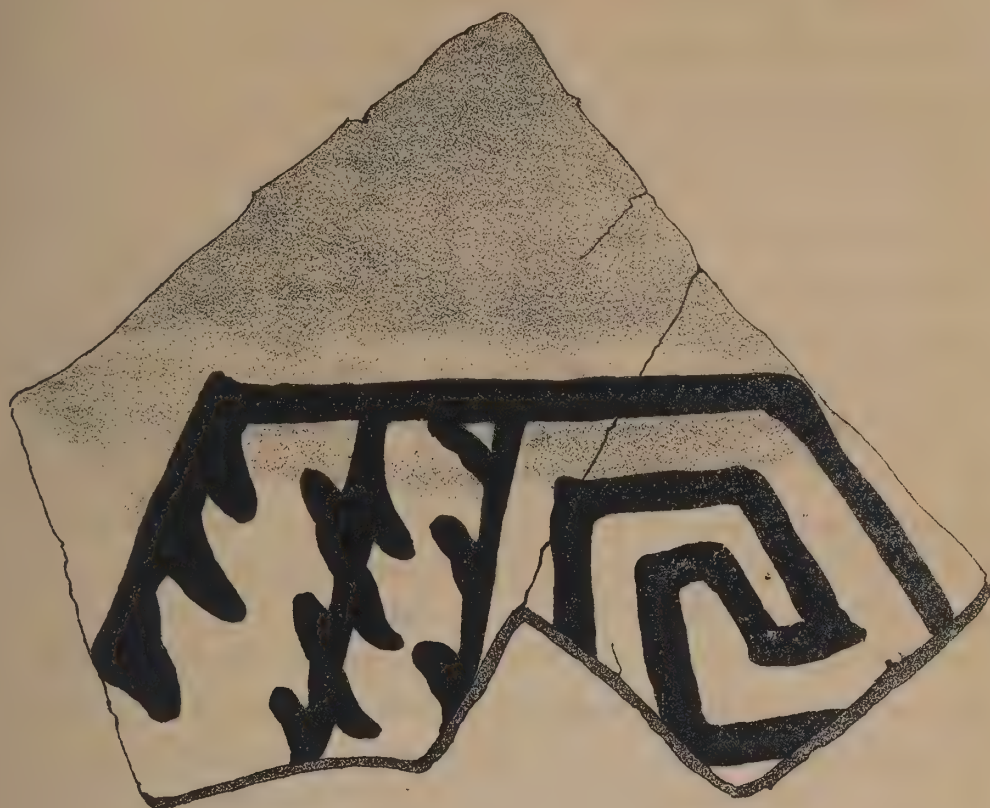


R. H. Kern del.

P. S. Duval's Steam lith press. Phil.

RUINS OF AN OLD PUEBLO  
in the Cañon of Chelly - Sept. 8<sup>th</sup>





R. H. Kern del.

P. S. Duval's steam lith. Press. Philad. ?

POTTERY FOUND AT THE PUEBLO,  
in the Cañon of Chelly.





can well be conceived to be, but they are perfectly free from a talus of debris, the usual concomitant of rocks of this description. Does not this point to a crack or natural fissure as having given origin to the cañon, rather than to aqueous agents, which, at least at the present period, show an utter inadequacy as a producing cause?

About five miles from the mouth, we passed another collection of uninhabited houses, perched on a shelf in the left-hand wall. Near this place, in the bed of the cañon, I noticed the ordinary Navajo hut, (a conical lodge,) and close by it a peach orchard. A mile further, observing several Navajos, high above us, on the verge of the north wall, shouting and gesticulating as if they were very glad to see us, what was our astonishment when they commenced tripping down the almost vertical wall before them as nimbly and dexterously as minuet dancers! Indeed, the force of gravity, and their descent upon a steep inclined plane, made such a kind of performance absolutely necessary to insure their equilibrium. All seemed to allow that this was one of the most wonderful feats they had ever witnessed.

Seven miles from the mouth, we fell in with some considerable pueblo ruins. These ruins are on the left or north side of the cañon, a portion of them being situated at the foot of the escarpment wall, and the other portion upon a shelf in the wall immediately back of the other portion, some fifty feet above the bed of the cañon. The wall in front of this latter portion being vertical, access to it could only have been obtained by means of ladders. The front of these ruins measures one hundred and forty-five feet, and their depth forty-five. The style of structure is similar to that of the pueblos found on the Chaco; the building material being of small, thin sandstones, from two to four inches thick, imbedded in mud mortar, and chinked in the façade with smaller stones. The present height of its walls is about eighteen feet. Its rooms are exceedingly small, and the windows only a foot square. One circular estuffa was all that was visible. For a sketch of these ruins, with the stupendous rocks in rear and overhanging them, see Plate 53; and for a sketch of the pottery picked up about them, see Plate 54.

Half a mile above these ruins, in a re-entering angle of the cañon, on its left side, are a peach orchard and some Navajo lodges. Proceeding still further up the cañon, the walls, which yet preserve their red sandstone character, but which have in-

creased in the magnificence of their proportions, at intervals present *façades* hundreds of feet in length, and three or four hundred in height, and which are beautifully smooth and vertical. These walls look as if they had been erected by the hand of art—the blocks of stone composing them not unfrequently discovering a length in the wall of hundreds of feet, and a thickness of as much as ten feet, and laid with as much precision, and showing as handsome and well-pointed and regular horizontal joints, as can be seen in the custom-house of the city of New York.

About eight miles from the mouth of the cañon, a small rill, which below this point had lost itself in the sandy bottom of the cañon, appears above ground; and about five hundred yards further, on the right-hand side, is a lateral cañon, in which we saw another peach orchard.

Having ascended the cañon nine and a half miles, the horses of the Pueblos in company with us not being strong enough for a further exploration, there being no prospect of our seeing the much talked of *presidio* or fort of the Navajos, which had all along been represented to us as being near the mouth of the cañon, and the *reconnaissance* having already been conducted further than Colonel Washington had anticipated would be found necessary, the expedition returned to camp, highly delighted with what they had seen. We found, however, the further we ascended it, the greater became the altitude of its enclosing walls; this altitude, at our point of returning, being (as I ascertained by an indirect measurement) five hundred and two feet. The length of the cañon is probably about twenty-five miles. Its average width, as far as we ascended it, may be estimated at two hundred yards. For a view of the cañon, as seen from the lateral branch eight miles above its mouth, see Plate 55.

Both in going up and returning through the cañon, groups of Navajos and single persons were seen high above our heads, gazing upon us from its walls. A fellow upon horseback, relieved as he was sharply against the sky, and scanning us from his elevation, appeared particularly picturesque. Whenever we met them in the cañon, they appeared very friendly; the principal chief, Martinez, joining and accompanying us in our exploration; and the proprietors of the peach orchards bringing out blanket-loads of the fruit (at best but of ordinary quality) for distribution





R.H. Kern del<sup>t</sup>.

P.S. Duval's Steam lith. press Phil.

CAÑON OF CHELLY,  
eight miles above the mouth. — Sept. 8<sup>th</sup>.





among the troops. Indeed, the chief admonished his people, as they stood gazing upon us from the heights above, to go to their homes and give us no trouble.

I noticed the cross, the usual emblem of the Roman Catholic faith, stuck up but in one instance in the cañon; and this is the only one I have seen in the Navajo country.

Should it ever be necessary to send troops up this cañon, no obstruction would be found to prevent the passage of artillery along its bottom. And should it at the same time, which is not at all unlikely, be necessary that a force should skirt the heights above to drive off assailants from that quarter, the south bank should be preferred, because less interrupted by lateral branch cañons.

The mystery of the Cañon of Chelly is now, in all probability solved. This cañon is, indeed, a wonderful exhibition of nature, and will always command the admiration of its votaries, as it will the attention of geologists. But the hitherto-entertained notion that it contained a high insulated plateau fort near its mouth, to which the Navajos resorted in times of danger, is exploded. That they may have had heights upon the side walls of the cañon, to scale which would require a series of *fourteen ladders*, is indeed probable; for it would require more than this number to surmount the height we measured.

I did expect, in ascending the cañon, to find that the Navajos had other and better habitations than the conical pole, brush, and mud lodge which, up to this time, we had only seen. But none other than these, excepting ruined ones, the origin of which they say they know nothing about, did we notice. Indeed, a Mexican who is a member of the command, and who was a captive among them, says they have no other habitation. In the summer, he informs us, they live wherever the cornfields and stock are. In the winter, they take to the mountains, where they can get plenty of wood. As yet, we have not met a single village of them; it appearing to be their habit to live scatteringly, wherever they can find a spot to plant corn or graze stock. The necessity of living more densely, probably, has not heretofore existed, from the feeling which they doubtless have had, up to this period, that the inaccessibility of their country was a sufficient barrier to the intrusion of an enemy.

It seems anomalous to me that a nation living in such misera-

bly constructed mud lodges should, at the same time, be capable of making, probably, the best blankets in the world!

Gregg, in introducing his remarks relative to their skill in this kind of manufacture, holds the following language:—

“They (the Navajos) reside in the main range of the Cordilleras, one hundred and fifty to two hundred miles west of Santa Fé, on the waters of Rio Colorado of California, not far from the region, according to historians, from whence the Aztecs emigrated to Mexico; and there are many reasons to suppose them direct descendants from the remnant, which remained in the north, of this celebrated nation of antiquity. Although they live in rude *jacales*, somewhat resembling the wigwams of the Pawnees, yet, from time immemorial, they have excelled all others in their original manufactures; and, as well as the Moquies, they are still distinguished for some exquisite styles of cotton textures, and display considerable ingenuity in embroidering with feathers, the skins of animals, according to their primitive practice. They now, also, manufacture a singular species of blanket, known as the Sarape Navajo, which is of so close and dense a texture that it will frequently hold water almost equal to gum-elastic cloth. It is therefore highly prized for protection against the rains. Some of the finer qualities are often sold among the Mexicans as high as fifty or sixty dollars each.”\*

As regards the hypothesis which Gregg advances in the above, that the Navajos are the direct descendants of the Aztecs, it is possible they may be. But if, as is likely, and as Gregg also supposes, this ancient people once inhabited the pueblos, now in ruins, on the Chaco, how is it that they have retrograded in civilization in respect to their habitations, when they have preserved it in their manufactures?

I know of but two ways to account for it. Either the Navajos are descended from a cognate stock, *prior* to that which built the Chaco pueblos, which stock lived, as the Navajos do now, in lodges—and this agrees with the tradition given by Sandoval;† or, in process of time, the cultivable and pastoral portion of the country becoming more and more reduced in area, and scattered in locality, the people of necessity became correspondingly scattered and locomotive, and thus gradually adopted the habitation

\* Commerce of the Prairies, vol. 1, pages 285 and 286.

† *Ante*, August 28.—Discussion of the origin of the Chaco ruins.



most suitable for such a state of things—the lodge they now inhabit.

In regard to the manufacture of *cotton* fabrics, in which, according to Gregg, they excel, we observed no evidences at all of this species of manufacture among them, nor any signs of the domestic culture of the plant from which, rather than from a foreign source, they would be most likely to draw the raw material.\*

In regard to the manufacture of *plumage*, or feather-work, they certainly display a greater fondness for decorations of this sort than any Indians we have seen; but, though they exhibit taste in the selection and disposition of this kind of ornament about their persons, I saw no exhibition of it in the way of embroidery.

In respect to the population of the Navajo nation, it has been impossible for me to arrive at anything like an approximation of it. Indeed, if the few we have seen bear a proper proportion to the whole number contained in the country, the extent of this population has been greatly exaggerated. But I prefer to believe that, as a nation, they live much scattered, and that those through whose precincts we have passed have studiously avoided us. All things considered, then, I would estimate the population from eight thousand to ten thousand souls: this last number is Gregg's estimate.

As regards their stock, so far as I could observe, and from what the reclaimed Mexican captive before referred to has told me, I should say that it consisted mainly of sheep and horses; mules and cattle forming but an inconsiderable portion of it. We have as yet, however, not fallen upon a drove of either of these animals; which the Mexican explains by saying that they have, the better to conceal them from the troops, been driven to the mountains. Innumerable signs of sheep, however, have been seen by us. The horses, though generally better than those to be seen among the New Mexicans, and capable of long and rapid journeys under the saddle, are not, in my judgment, near so fine as what I have seen among the Comanches; and in

\* Since writing the above, on inquiry, I learn from Señor Vigil that the Navajos (he has been in their country) formerly manufactured a few cotton fabrics from the raw material, which they were in the habit of importing from Santa Fé and other places; but that this species of manufacture has now almost, if not entirely, ceased.

all these cases they are far inferior to our own, in point of bulk and power.

*Nineteenth camp, Chelly, September 9.*—To-day, the two chiefs, Mariano Martinez and Chapaton, the latter the chief of the San Juan Navajos—(see his portrait in Plate 50) have been in, on the part of the nation, to deliver up some of the captives, stock, and other property required to be delivered according to the treaty made by Colonel Nuby; and also to enter into a more comprehensive and complete treaty. A large portion of this property not being immediately available, as they said, on account of the distance whence it had to be brought, the colonel commanding, with their consent, appointed a limited period—thirty days—in which all that yet remained outstanding was to be delivered up at Jémez. The murderer of a citizen of Jémez was, as soon as he could be apprehended, to be turned over to the governor at Santa Fé.

The parties then entered into a treaty, by which the government of the United States assumed the paternal control it has been in the habit of exercising over the tribes of Indians within or bordering upon its domain; and the Navajo nation, on its part, through its head chiefs, Martinez and Chapaton, who represented that what they did was binding on the whole nation, gave their full and unequivocal assent to all its terms. Particular care was taken, both by the colonel commanding and the Indian commissioner, to make the chiefs comprehend the full import of the treaty to which they were invited to give their assent. And, to be certain that all was done that could be done to insure this, each and every officer present was appealed to, to know whether he considered the treaty had been sufficiently explained; to which they all, without exception, responded in the affirmative.

All that could be accomplished by the expedition, then, may be considered as having been accomplished. A full and complete treaty has been made with the Navajos, by which they have put themselves under the jurisdiction and control of the government of the United States, in the same manner and to the same extent as the tribes bordering the United States. The portion of the captives and stolen property near enough to be made available have been given up, and the remainder has been promised to be restored within a determinate period. Add to this, what is of no inconsiderable value, the troops have been enabled to

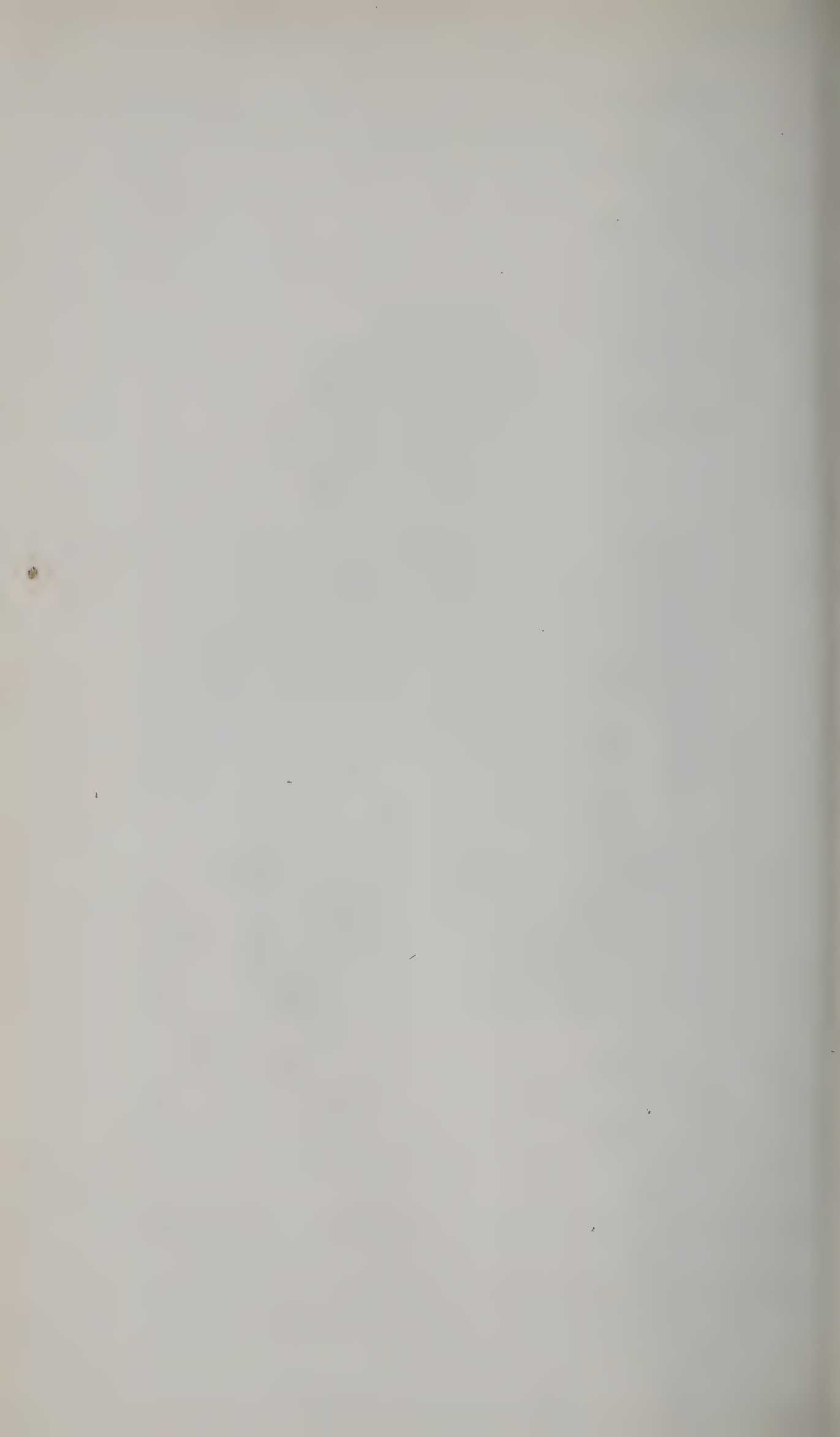




Drawn by E. M. Kern from a sketch by R. H. Kern.

P. S. Duval's Steam Lith. Press Philad.

CHAPATON  
Chief of the S. Juan Navajos.  
*Sept. 8<sup>th</sup>*









E. M. Kern delt.

P. S. Duval's Steam Lith. Press Philad.<sup>a</sup>

CHEKI-WAT-TE-WA

(Yellow Wolf) a Moqui.

Sept 8<sup>th</sup>





*C. Simmes del.*

R H Kern del.

P S Duval's Steam Lith Press Philad.

NAVAJO COSTUME.





penetrate into the very heart of their country; and thus a geographical knowledge has been obtained, which cannot but be of the highest value in any future military demonstration it may be necessary to make.

It is true the Navajos may fail to comply with the terms of the treaty. But, whether they comply or not, the fact still remains the same, that a treaty *covering the whole ground* of their fealty, (the former covered but a few points,) as well in the general as the particular, was necessary, in order to satisfy the public mind, as well as testify to the whole world that, should any future coercion become necessary, it would be but a just retribution, and, in a manner, their own act.

In the afternoon, after the treaty was concluded, quite a number of Navajo warriors, at least a hundred, came within the vicinity of the camp to trade with the troops, seemingly happy that so peaceful a termination had been given to affairs. They were generally armed with bows and lances, and carried also shields. Very few of them had rifles. In some instances they were very handsomely dressed, an appendage of eagle feathers to their helmet-shaped cap adding not a little to the picturesqueness of their appearance. (For a sketch of a Navajo in costume, see Plate 52.)

Their principal articles of traffic consisted of blankets of their peculiar and superior handiwork, dressed skins, and peaches.

The blankets, though not purchasable with money, as it is not used as a tender among them, were sold, in some instances, for the most trifling article of ornament or clothing; it being their manner, if they saw anything about your dress which they fancied, and wanted to buy, to point to it, and then to the article for which they were willing to barter it.

There was a Moqui Indian present at the council this morning as a spectator; and a more intelligent, frank-hearted looking fellow, I have seldom beheld. (See a sketch of him in Plate 51.) Indeed, it occurred to me that he had all the air and manner of a well-bred, vivacious American gentleman; and the only thing Indian in his appearance was his complexion. His people, whom he represents as living three days' travel from this place, have the *reputation* of being quite intelligent and orderly; it being one of the articles of their political as well as religious creed that they are at liberty under no circumstances to take human life;

and in regard to infidelity on the part of their women, their laws are said to be very stringent. These people, I am informed, herd stock, grow corn, and live in pueblos, of which there are, according to the Moqui present at this time, but three. It is reported that originally they had a greater number of towns; but, one or more of them becoming guilty of shedding human blood, they were on that account excised. Does not this article of their creed, if true, point to a civilized origin? At all events, there is nothing in the features, manners, and general appearance of the Moqui I have seen to belie such an hypothesis, but, on the contrary, a great deal to make it probable.\*

Martinez, the principal Navajo chief, brought in a beautiful mule this morning to present to the colonel commanding. The colonel, however, with the remark that it was neither customary nor proper on the part of public officers to receive such presents, graciously declined it.

There having been various contradictory reports among us relative to other American troops having visited Chelly besides Colonel Washington's command, I to-day inquired of Martinez whether such was the fact. His reply was, that the first American troops that had visited Chelly were those at present there.

The climate of this valley we find much milder during the night than that we have heretofore experienced since leaving Jémez.

*Twentieth camp, September 10.*—Colonel Washington learning yesterday from Chapaton that Captain Ker was not on his way to meet him at this place, as he was led at Tunecha, through information from a chief, to believe might be the case; and a report having been received that the Apaches had within a few days made an attack upon the friendly Pueblo Indians of Zuñi, and killed a number of them; the programme of operations has accordingly been altered; and our destination is now Santa Fé,

\* It is proper, however, to state that Señor Vigil, who has twice visited these people, says he knows nothing of this peculiar article of their faith. He knows, however, that, though they are a docile people, they once were in a defensive war with the Navajos, against whom they used the bow and arrow. I suspect, when the exact truth is known with regard to these people, it will be found that, though inclined to a state of peace, they are not so disinclined to war as not, under coercive circumstances, to stand up, even at the risk of bloodshed, to defend their lives and property.



by the way of Zuñi; the object being to afford this people all the necessary aid which their reported situation demands.

The troops accordingly took up their line of march from Chelly at 7 A. M., the general course for the day being south-east. For the first two miles our route lay up the valley of Chelly, and then turned more eastwardly; it at this point commencing the ascent of a species of *mésa*, or rather upland. Three miles further, the road approximates within a few yards of the Cañon of Chelly. To this point the road is exceedingly rocky and hilly; but these hills can in all probability be avoided by continuing up the valley of Chelly as far as opposite the point mentioned, and then turning to the left up the *mésa*. (See map.) The country at the point referred to begins to be rolling; scrub pine and a species of spruce, thickly interspersed, constituting the *sylva*. Four miles further, a protrusion of trap rock, looking for all the world like the square tower of a church, with windows, could be seen, bearing northeast, some twelve miles off. Eighteen miles from our last camp, we commenced the ascent of the *Sierra de Laguna*, the slope of which wagons would find some difficulty in overcoming, unless one more easy could be found—a thing not at all improbable—or some labor be expended. The ascent we found to be two miles long—which accomplished, we were on a plateau; a mile more bringing us to our camp-ground for the night, where we find an abundance of wood, a sufficiency of pasturage, but no water.

The soil to-day has been principally of an arid, argillaceous character; the scrub pine and cedar characterizing this portion of the route. Since commencing the ascent of the *Sierra de Laguna*, scrub oak and yellow pine of a large growth have been the *sylva*. *Cacti* have been frequently seen. We crossed a number of heavy Navajo trails; and signs of large droves of sheep were observable. The day's march has been 20.50 miles.

*Twenty-first camp, September 11.*—The troops raised camp at a quarter after 6 A. M., and followed, as yesterday, a well-beaten trail; the general course for the day continuing about southeast. Having proceeded two and a half miles, one of the guards sent in advance yesterday to find water, returning and informing the colonel commanding that there was some in a cañon to the left, about five miles off, a detour to the northeast was made by the troops in order to reach it. This cañon is *said* to be a branch

of the Cañon de Chelly; and its banks were so steep as to make it necessary for the animals to be disburdened of their packs to enable them to reach the water at its bottom. The supply we found ample, and it doubtless is constant.

After halting for about an hour, the troops resumed the march, the remaining portion of the day's route continuing slightly more southwardly.

For the first fourteen and a half miles the country is a pine barren, resembling very much in appearance, and in the arenaceous character of its soil, the pine barrens of Florida, excepting that the former is more compact. For the remaining portion of the route, it is a rolling prairie, variegated with copses of piñon; the soil being of a reddish color, argillaceous in character and doubtless fertile, if sufficiently watered. Five miles before reaching our present camp, a *mésa* escarpment comes in from the left, and skirts the road on that side for the balance of the way. The walls of this *mésa* are probably from three to four hundred feet in height. Just before reaching camp, a most singular-looking column appears on the left of the road; resembling, when viewed near by, a vase; when remotely, a statue. It is of sandstone formation, and has an altitude of from thirty to forty feet. (See sketch in Plate 56.)

Our camp for the night is more pleasant than usual—a small pond or lake, bordered by a margin of green luxuriant grass, being directly in front of us, to gladden our sight; and the beautiful stratified walls of the *Cañoncito Bonito*, down which we are to turn to-morrow, adding its beauty to the scene. Some ducks, I notice, are constantly hovering around this spot.

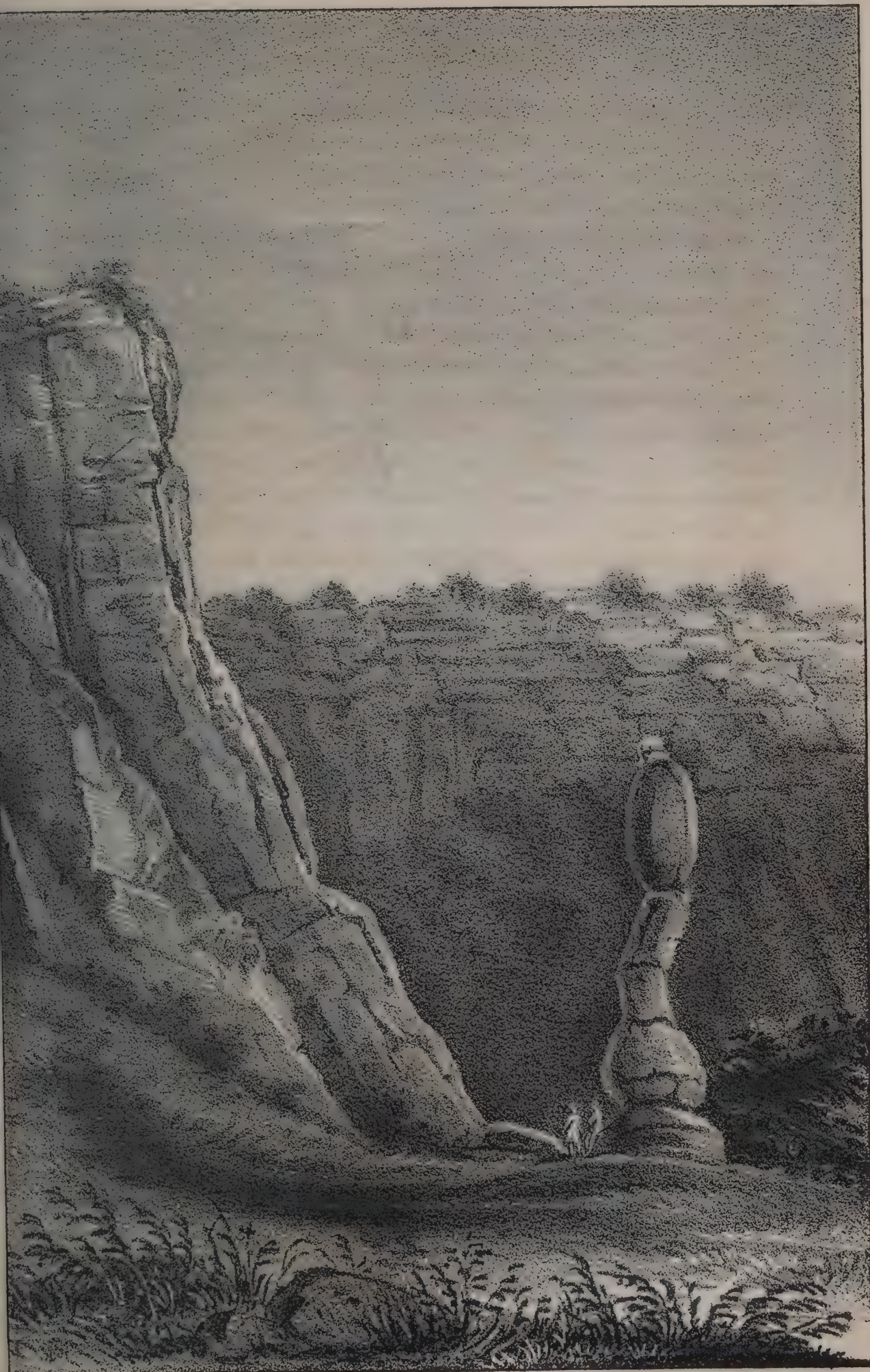
The road to-day has been good. The distance marched is 24.83 miles. Several showers of rain have passed around us.

Astronomical observations put this camp in longitude  $109^{\circ} 15' 30''$ .

*Twenty-second camp, September 12.*—Failing, on account of a hazy atmosphere, to get my usual astronomical observations last evening, I succeeded, after the exercise of a great deal of patience, to get a few barely tolerable ones after midnight.

The command left this excellent camp-ground at 7 A. M.; its general course for the day being a trifle west of south. Immediately on resuming the march, we turned short to the left, or eastwardly, to thread the *Cañoncito Bonito*, (Beautiful Little





R.H. Kern delt.

P.S. Duval's Steam lith. Press, Philad<sup>a</sup>

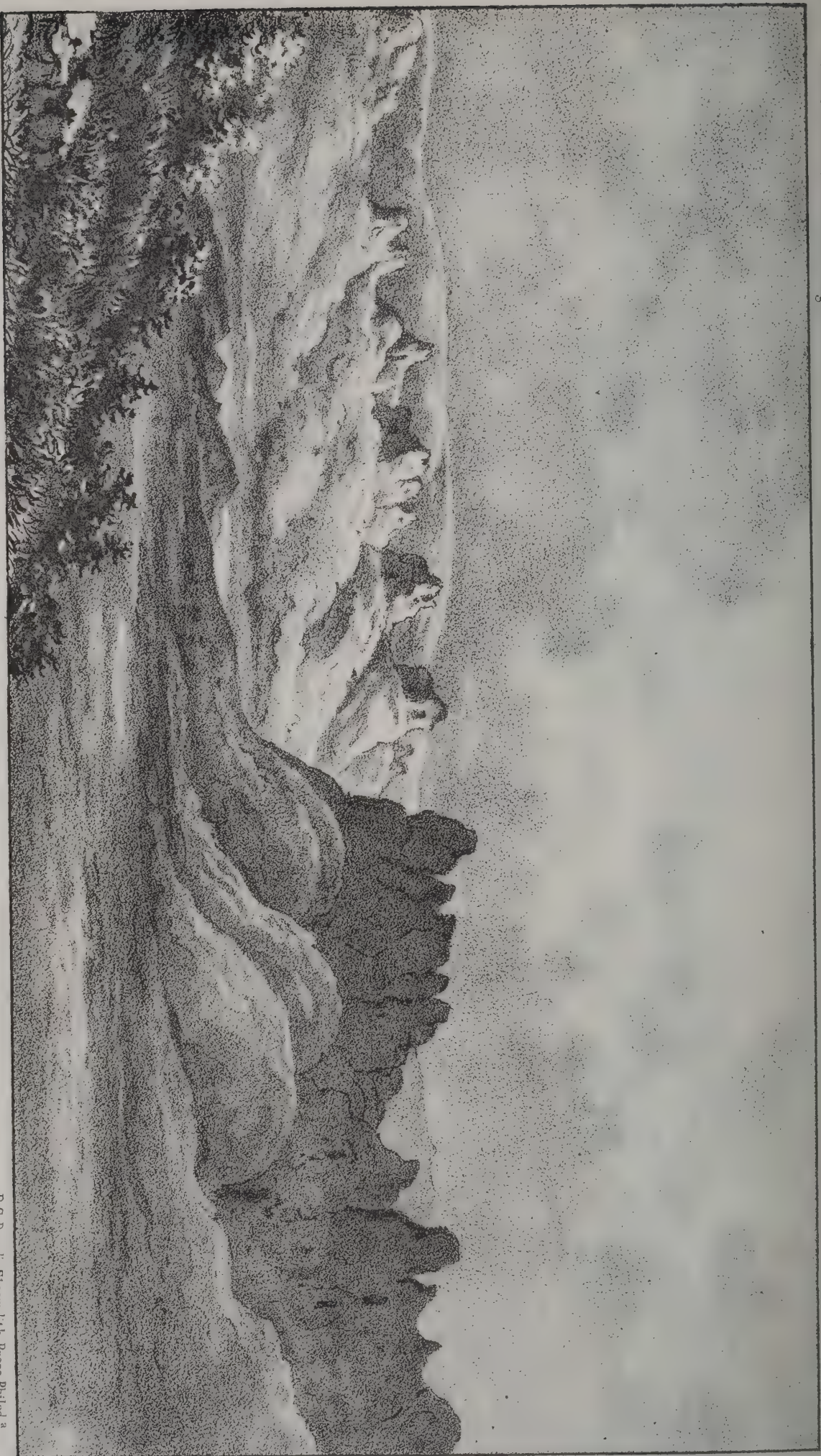
NATURAL SANDSTONE FORMATION,

near Camp 21. Sept 11.









R. H. Kern delt.

P. S. Duval's Steam Lith. Press Philad. a

TRAP DYKE AND SAND STONE FORMATIONS,

between Camps 21 and 22.—Sept. 12<sup>th</sup>.



Cañon.) This cañon, which is about a quarter of a mile in length, is, on account of its high enclosing walls, and the well-defined character of their stratification, beautiful. The walls, which are nearly vertical, are probably from three to four hundred feet high. The formation is a red friable sandstone; the stratification, which discloses a dip of about ten degrees towards the east, as also the line of cleavage, being very distinctly marked. The width of the cañon is about one hundred feet, a small stream finding its way through its bottom. This cañon differs from that of Chelly, in the face of its walls not being so smooth; in not presenting as large unstratified masses; and having a *talus* of *debris* at the foot of the walls.

This cañon passed through, the route turned almost due south; following, for the remaining portion of the day, a succession of wide, shallow, fertile valleys, which are generally bordered on their eastern side by escarpment walls of a white and red sandstone formation.

Just after we debouched from the *Cañoncito Bonito*, a most singular prospect of detached turret-like rocks appeared skirting the valley just referred to on its eastern side. And down the valley, in a more southerly direction, a trap dyke of a striking character presented itself, a short distance to our front. For a sketch of this view, see Plate 57. This dyke, on examination, I found to present a most interesting exhibition of igneous action and vertical protrusion. Its height above the plain is some three or four hundred feet; its breadth, one hundred and fifty; and its length, about two hundred yards. Its strike is nearly due east. Here can be seen, in the same formation, rocks that have been once perfectly fused, and then cooled under pressure, the effect being to make them more dense; rocks that have been fused, and then cooled under the pressure only of the atmosphere, the effect being to make them scoriaceous; and rocks that look as if they had not been fused, but merely baked. I noticed also here, in a sort of cave, a large mass of the same kind of black, agglutinated, pitchy substance I have already described as having been seen, August 24, in the rocks of the *Cañon de la Copa*. It was here, as there, intermingled with bits of straw, &c. These are the only trap rocks we have seen near our route since we left our eighteenth camp.

About nine miles from our last camp, on the route, is *Siene-*

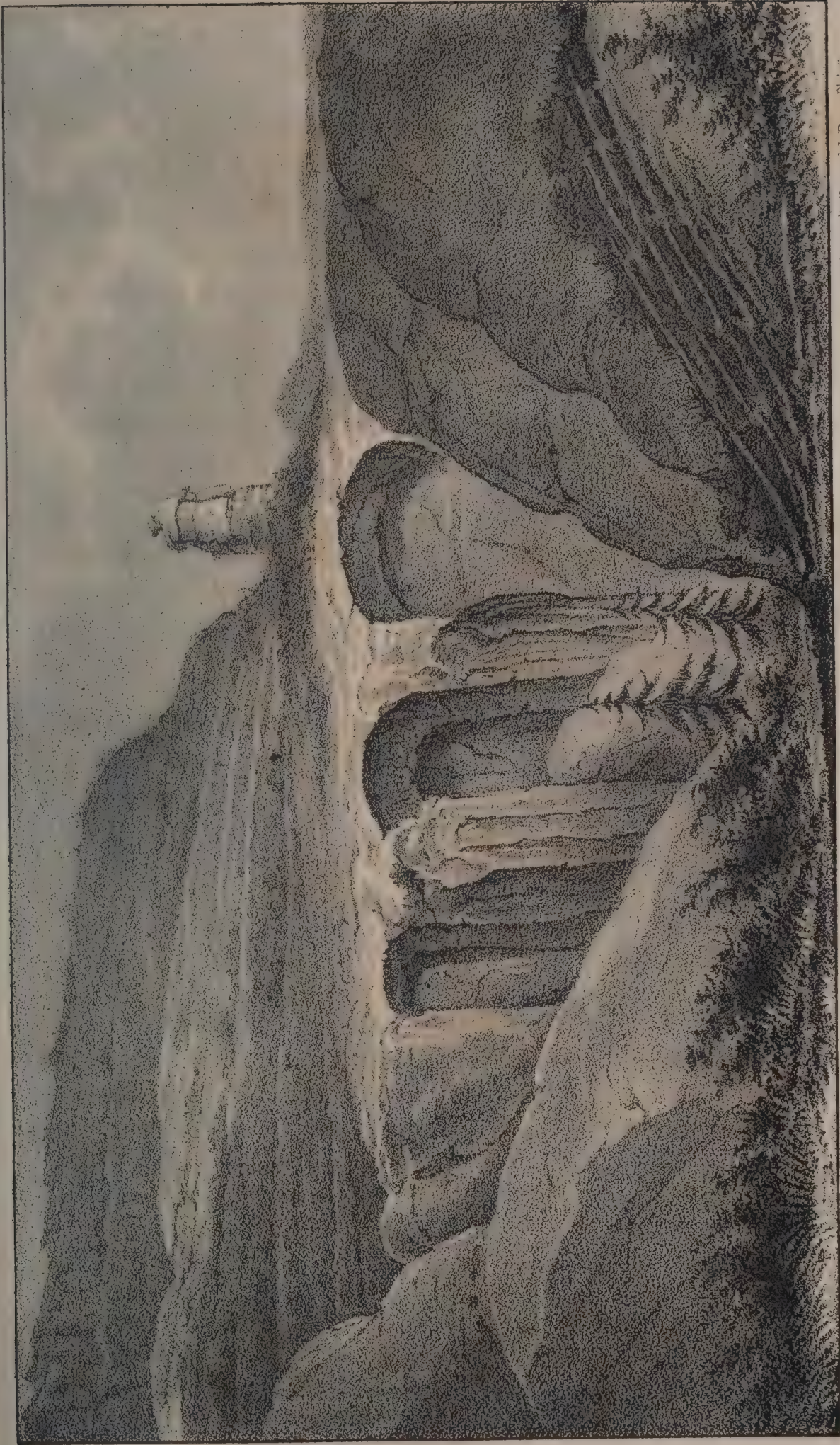
*guilla de Maria*, where we found some very cold water, and grass of an excellent quality. The supply of water here is probably perennial. Three miles further, some very singular whitish abutment rocks, probably of sandstone, are to be seen on the left, jutting out from among rocks of a sandstone character and red color. The difference in the complexion and shape of the former of these rocks indicates a superior hardness, in the formation of which there are prominences. Four miles further, just to the right of the road, appears a beautiful exhibition of horizontal stratification, terminating in one of a bent, semicircular character—the strata (red sandstone) in the last case being concentric, like the coatings of an onion, and disclosing themselves both by a side and end view. Eighteen miles from our last camp, we crossed a rough, bad place, where some little labor would be required to make it practicable for wagons. Two miles further, immediately on the left of the road, are two enormous hemispherical masses of solid sandstone rock; the radius of one of them being about one hundred feet.

After a march of 23.02 miles reaching a babbling streamlet of excellent water, which heads in a spring not far distant, and the vicinity affording fine pasturage and plenty of fuel, we encamped.

The soil to-day along the route has been of an argillaceous character, and looks as if it might produce well. As usual, pine and cedar, of rather a scrub growth, have constituted the timber. A deer was killed by a soldier this morning, after running the gauntlet of numerous shots from the command—myself, among the number, throwing away a pistol shot. This is the first deer which has been killed by any of the party. The scarcity of this kind of game may therefore readily be inferred. Indeed, a more wretched country for game of every kind I have never seen than that we have been traversing since we left Santa Fé. A rattlesnake was also killed to-day, and a wildcat is reported to have been seen. I noticed to-day, for the first time on the march, a flock of blackbirds. I have also seen, along the route, a species of swallow different from anything of the kind I have ever before met with. It is peculiar in being, a large portion of it, both on its back and its belly, white. It probably is a bank swallow.

It is reported that there is a wagon route from *Cañoncito Bonito* to the Pueblo of Jémez; but as I have no certain knowledge





R. H. Kern del.

P. S. Duval's Steam lith. Press: Philad.

NATURAL SANDSTONE FORMATIONS

near Camp 23-Sept 13<sup>th</sup>







of its existence, and none at all of its location, I cannot even trace it generally on my map.

The longitude of this camp, by observation, is found to be  $109^{\circ} 18' 30''$ .

*Twenty-third camp, September 13.*—In consequence of a settled, steady rain, nearly all last night—a thing uncommon in this country—the troops did not raise camp to-day till about noon. Our route to-day has been a little east of south, through a narrow valley, skirted on the left by a red sandstone escarpment, and on the right by a height, sloping gently towards the valley.

Two miles on the way, to the right of the road, a cañon comes in from the southwest, exhibiting some red sandstone rocks, beautifully stratified in curves; very similar to those of the cycloid reversed.

Just before reaching camp, we noticed to the left of the road a singular combination of swelling buttresses, vertical piers, and caves, and surmounting the whole a natural sandstone formation having very much the appearance of a tankard. The cover, as well as the handle, was perfect in outline—the latter appearing not a little like the embodiment of William Penn. (See sketch in Plate 58.)

A few hundred yards from this, in the direction of our progress, a beautiful view opened upon us, made up of finely stratified and variegated rocks, and a refreshing green valley interspersed with copses of cedar.

The soil to-day has been argillaceous, and looks productive. The *sylva* has been large yellow pine, cedar of a medium size, and a few scrub oaks. The *artemisia* has been very common. Limestone boulders have been seen to-day for the first time since we left the valley of the *Rio de Jémez*. Fragments of pottery are found about our present encampment, as they have been about others; and, what seems strange, and has occurred at other points, is, that you not unfrequently find it in localities where you would not suppose anybody would ever think of having a habitation.

Our encampment to-night appears peculiarly beautiful. The heavens are deeply blue; the stars shine resplendently bright; the bivouac fires mark well the form and extent of the camp; and peacefully ascending can be seen the blue smoke—the whole

forming, in combination with the general cheerfulness which pervades all nature, both animate and inanimate, a most pleasing picture. Indeed, this cheerfulness has been a general characteristic of our encampments ever since we began the march.

The water near our camp, which is in small pools, can only be relied on after showers. The grazing is good and wood abundant.

Some cutting of cedars along the route to-day would probably be required to make it practicable for wagons.

*Twenty-fourth camp, September 14.*—The march was resumed at 7 o'clock A.M., the course for the day being about southeast. Two miles on the route, we crossed an *arroyo*, coming in from the north, and coursing through a valley half a mile wide, this valley being skirted on either side by *mésa* heights of red sandstone. The arroyo, I noticed, had a few cotton trees bordering it. Five miles more brought us to a steep hill, about eighty feet high—ascending which, we got out of the valley we had been traversing since we left camp. Wagons, to overcome this hill, would require a slope of easier ascent than the one we followed; and this could be attained by making a road, half excavation and half embankment, along the side of the hill, or, what is very probable, by finding a natural grade at some other locality. Three miles further, another very steep hill, of about one hundred feet in altitude, was surmounted. Here, as at the other hill, a better locality could doubtless be found for a wagon road, or this one be made practicable, as suggested in relation to the other. The ascent of this hill accomplished, we again descended and crossed another valley, and then a succession of shallow ones, until we reached a cane-brake pond, where, finding a bare sufficiency of water and some good grass, we encamped. The taste of the water, as well as its discoloring effect upon the soil through which it oozes, shows it to be decidedly of a chalybeate character.

Fragments of painted pottery were seen to-day for miles strewn along the road.

The soil for the first two-thirds of the route has been argillaceous and fertile; the last third was arenaceous and arid. The *sylva* has been piñon, yellow pine, and cedar. *Artemisia*, as usual, has been very common. Nodules of compact limestone are found on the road eight miles from our last camp, in an ar-



gillaceous soil. More labor would be required on the route to-day to make it practicable for wagons than upon any portion since we left Chelly; but still it can be done without a very considerable expenditure of labor.

Our march to-day, though but 12.08 miles, has been, on account of the heat, more exhausting to the men than any day's march we have had.

I find this camp, by astronomical observation, to be in latitude  $35^{\circ} 11' 56''$ , and longitude  $109^{\circ} 6' 45''$ .

*Twenty-fifth camp, September 15.*—The troops decamped at 7 o'clock A. M., the general course for the day being, as yesterday, about southeast. They immediately commenced ascending a hill, which would require a little labor to make it practicable for wagons. Having proceeded four and a half miles, we reached the brow of a long gradual slope, whence an extended prospect of distant mountains, mountain peaks, *mésas*, and valleys burst upon us, some of these peaks being probably as much as one hundred miles off. Three and a half miles further, we crossed an *arroyo*, which would require some little labor to make it traversable by wagons. Half a mile further, an old rubble stone wall, without mortar, of an inferior character, we passed on our left. Two miles further, a couple of *mésa* mounds, with a very singular-looking pinnacle standing isolated between them, were also to be seen on the left.

Thirteen miles from our last camp, we entered the valley of the *Rio del Pescado*, (or, as some call the stream, the Rio de Zuñi,) which we find extensively cultivated in corn. There are indications also of there having been an abundant harvest of wheat. The Pueblo of Zuñi, when first seen about three miles off, appeared like a low ridge of brownish rocks—not a tree being visible (a general characteristic of Mexican and pueblo towns) to relieve the nakedness of its appearance. We had not more than begun to get sight of the pueblo, when we noticed a body of Indians approaching us from it. This party purported to be a deputation, headed by the governor (*cacique*) and *alcalde*, which had come out for the purpose of escorting the Governor of New Mexico (Colonel Washington) into town. Their reception of the governor and his suite was very cordial. The *alcalde*, I noticed, was habited in the undress frock of the officers of the army, garnished with the white metallic button.

After proceeding in company about a mile, we were unexpectedly saluted, at a preconcerted signal from a chief, with an exhibition of a sham fight, in which men, young and old, and boys entered with great spirit. Guns were fired, dust was thrown in the air, men on foot and on horseback could be seen running hurry-scurry hither and thither, the war-whoop was yelled, and altogether quite an exciting scene was exhibited. Just as we reached the town, quite an interesting scene occurred. All the male inhabitants of the place, including gray-headed old men, the middle-aged, and the youthful portion of the population, came out to see the governor and shake hands with him. It was particularly interesting to see the juvenile portion of the community engaged in this refined act of courtesy. The governor and suite were then conducted to the *casa* (house) of the governor of the pueblo, where bread, in every variety of form, (loaf, *tortilla*, and *guayave*,) watermelons, muskmelons, and peaches, were laid in profusion before us.

Governor Washington took this occasion to make known to the chief men of the pueblo the cause of his coming among them, (the report, now found to be false, of the Apaches having killed some of their people,) and expressed to them the great satisfaction he felt in seeing their people in so flourishing a condition. He also represented to them the care which the government of the United States had for their welfare. The talk over, the governor and his suite, after bidding their hospitable entertainers *adios*, continued their journey a couple of miles further to the camp for the night.

Zuñi is a pueblo or Indian town situated on the Rio de Zuñi. This river, at the town, has a bed of about one hundred and fifty yards wide; the stream, however, at the time we saw it, only showed a breadth of about six feet, and a depth of a few inches. It is represented as running into the Colorado of the West. The town, like Santo Domingo, is built terrace-shaped—each story, of which there are generally three, being smaller, laterally, so that one story answers in part for the platform of the one above it. It, however, is far more compact than Santo Domingo—its streets being narrow, and in places presenting the appearance of tunnels, or covered ways, on account of the houses extending at these places over them. The houses are generally built of stone, plastered with mud. It has a Roman



Catholic church, in dimensions about one hundred feet by twenty-seven, built of *adobes*. A miserable painting of *Nuestra Señora de Guadalupe*, and a couple of statues, garnish the walls back of the chancel. The walls elsewhere are perfectly bare. This is by far the best built and neatest-looking pueblo I have yet seen, though, as usual, the ragged picketed sheep and goat pens detract not a little from its appearance. The population of the place, based upon the number the governor has given me of persons capable of bearing arms, I estimate at 2,000. But, judging from the size of the town, and the number of its inhabitants I saw, I should not place it above 1,200. Gregg, I notice, puts it at between 1,000 and 1,500.\* And the author of Doniphan's Expedition (page 195) states that it is upwards of 6,000.

These people seem further advanced in the arts of civilization than any Indians I have seen. They have large herds of sheep and horses, and extensively cultivate the soil. Being far off from any mercantile population, they will sell nothing for money, but dispose of their commodities entirely in barter. Some of our command thought, from their apparent closeness in business transactions, they were the most contracted people they had met. But to my mind, in view of the treatment which they represent themselves to have received from a party of California emigrants which had but a week or two previously passed through their town, their conduct discovered only a proper degree of caution—a caution founded on the principles of self-conservation, and which it was wise only to allow to be removed in proportion as they discovered us to be different from that party; or, in other words, more worthy of their confidence.

In Doniphan's Expedition, (pages 194, 195, 196,) I notice that this pueblo is represented as having been *discovered* by that expedition; and the author, after calling it "one of the most extraordinary cities in the world," adds, "that perhaps it is the only one now known resembling those of the ancient Aztecs."

As regards the fact of its remaining undiscovered until the expedition of Colonel Doniphan brought it to light, I have only to remark, that the archives of the State Department of New Mexico show, from 1692, the year when these people were reconquered by the governor and captain-general of the State,

\* Commerce of the Prairies, note, page 269.

Curro Diego de Bargas Zapata, until the present time, they have been a recognized and loyal portion of said territory.\*

And as respects its claim to be regarded as "one of the most extraordinary cities in the world," and as undoubtedly resembling, and as probably being the only one now known to resemble, the cities of the ancient Aztecs, the only marked difference I can perceive between it and the pueblos I have visited in New Mexico is, that the town is rather more compactly built, and its streets at some points have the houses built over them. In the habits and dress of the people, so far as they exhibited themselves to us, excepting that they appeared to be somewhat more advanced in refinement, I could observe no difference between them and the other pueblos. So that one pueblo seems to have as good a claim to the Aztec descent, as far as appears to be known, as another. And who can say positively, or even with any *satisfactory* basis of hypothecation, that any of them are descended from that remarkable people?

\* For the following extract from the official journal of Don Diego de Bargas Zapata, now filed among the archives of the State Department at Santa Fé, I am indebted to Mr. Samuel Ellison, the official interpreter for that department. As it fixes the date of the conquering of Zuñi by New Mexico, and discovers incidentally the previous Spanish Roman Catholic rule which obtained over the pueblo, it will not be without interest. The literal translation furnished me by Mr. Ellison, I have freely turned into the following:—

"Tuesday, 11th November, 1692: I, the said governor and captain-general, on this day entered the Pueblo of Zuñi, and received the submission of its people. On the same day, the Reverend Fathers Corbera and Banoso baptized two hundred and ninety-four children, male and female. This concluded, I was conducted to a room, and shown an altar, on which were burning two large tallow candles. Removing a piece of ornament, I found the following articles of religious worship: two brass images of Christ, four inches in length, set in wooden crosses; also another image of Christ, eighteen inches long; a portrait of John the Baptist, beautifully executed; one consecrated vase, gilded with gold; a small box with two plates of glass, in which the host is exposed to public view; four chalices, all of silver, and of different patterns; one ancient mass-book, very well preserved; one confession-book, in the Spanish and Mexican language, &c., &c.

D. DIEGO DE BARGAS ZAPATA,

LUGAN PONCE DE LION,

MARTIN DE ALDAY,

JUAN PAIZ HURTADA,

ROQUE MACBRED,

JUAN DE DIOS,

CUCERO DE GODOY.

"Before me:

ALONZO RAIL DE AGUILAR,

*Secretary of State and of War."*







R.H. Kern del't.

PUEBLO OF ZUÑI.

Sept 15

P. S. Duval's Steam Lith. Press Philad'a



It is true that these people, as did the Aztecs, possess the art of taming birds; and some might reason from this that they are probably, on that account, from the same stock. But the people of the *Pueblo of Tesuque* also possess the same art. And Abert says it is an art common to the "Pueblos" generally.\* The Tesuques then, as also all the other Pueblos, on the ground mentioned, (taming of birds,) have equal claims to the same descent. But the languages of the Tesuques and the Zuñis, as will be seen by referring to Appendix B., are radically different. They cannot then have descended from a common stock. In other words, they cannot both be of Aztec origin, though both resemble the Aztecs in the practice mentioned. And so with all the other Pueblos. The different languages they speak are all resolvable (see Appendix B.) into six distinct tongues. If, then, either of them is to be regarded as of the Aztec descent, on the ground stated, all the others, on the ground of a radical difference of language, must be thrown out of the pale of that descent. And yet they all alike practice the same Aztec art.

The idea has also been entertained that the people of Zuñi "live in houses scooped from the solid rock." The description of their habitations which I have already given will show this to be a fallacy.

The Governor of Zuñi paid us a visit this evening; and a very interesting man we found him to be—about six feet high, athletic in structure, uncommonly graceful and energetic in action, fluent in language, and intelligent. In fact, he actually charmed me with his elocution. From him, I learned that his people, a long time ago, lived on a high *mésa* directly in front of our camp, the ruins of which, he says, are still visible; (see a sketch of Zuñi, with the *mésa* referred to in the background, in Plate 59;) that, according to tradition, the cause of their quitting it for their present location was as follows: The waters of the valley on one occasion came up higher and higher until at last they threatened to sweep them all away in the flood. Seeing this, they resorted to this expedient to save themselves: they let down into the waters, from the *mésa*, a man and a woman who had never known each other, and the result was their immediate subsidence.

\* Report of Lieut. J. W. Abert, of his Examination of New Mexico, 1846—1847, October 20.

But why they should go down from a *mésa* height into a valley, to protect themselves from another possible rise of water, is not apparent! I, however, give the narration just as it was interpreted to me by the official interpreter. The waters, the chief said, came from the Rio Grande and other rivers, and spouted up all around. If this rise of water is not altogether a fable, I know no other way to account for it than by supposing it to have been the result of an earthquake. He further represents that they came originally from the setting sun. To the question, whence the origin of the Albinos among them, he replied that they were all of pure Zuñi blood, (and I have since learned from him, at Santa Fé, that there are *but seven* of them among his people.) In regard to the ruins on the Chaco, he says he has seen them, but knows nothing of their origin.

Two Navajos came into camp this afternoon and delivered up a captive Mexican boy. They represent they are from *Chusca*, and that their people are collecting the stolen property for the purpose of surrendering it, agreeably to treaty.

The services of the Pueblo Indians being no longer required, they were this evening, after a complimentary notice of their conduct by the colonel commanding, discharged.

The soil to-day along the route, for the first eight miles, was arenaceous; for the balance of the way, it was argillo-arenaceous. For the first ten miles, the *sylva* was cedar and piñon; for the balance of the way, there was no wood to speak of. The distance marched was 17.45 miles. The road was heavy, but, with some little labor upon the *arroyos*, can be made practicable for wagons.

Just before reaching Zuñi, we passed the dead body of an Indian lying perfectly exposed upon the ground. We afterwards learned from the governor of the pueblo that the body was that of a Navajo prisoner, whom they had killed five days since, by direction of a California emigrant. Competent authority, surely.

*Twenty-sixth camp, September 16.*—I left this morning in advance of the troops, to visit the ruins of Old Zuñi spoken of by the governor of the pueblo last evening. To reach the *mésa* on which they are represented to be situated, I passed a large number of cornfields. On reaching the foot of the *mésa*, I found the ascent so difficult as not to be able, with the time I had at my disposal, to reach its summit. I therefore struck off diagonally to



meet the command, which I noticed had, in the mean time, at the usual hour, 7 A. M., resumed its march. I paused, however, sufficiently long near the *mésa* to contemplate the figure of a woman seated high up upon a pedestal, from which, with face turned towards the probable locality of the ruins, she presented the appearance of one overcome with grief at the sad picture which lay before her. The formation was probably of sandstone; and it is not at all unlikely that the narrative made by the governor last evening had a great deal to do with the conceit.

The route to-day, which has been slightly north of east, up the valley of the *Rio de Zuñi*, after getting a mile and a half from camp, passed between a couple of low *mésas*, capped with amygdaloidal trap—that on the left being surmounted with the remains of some old but comparatively recent buildings and *corral* enclosures. These structures have been built of basaltic boulders, coarsely held together with mud mortar. The circuit of the pueblo, in plan, is about five hundred by one hundred feet. I noticed here, for the first time on the march, a beautiful exhibition of lava, which had been fixed in its wavy, undulating state by sudden refrigeration. This locality is the commencement, eastward, of the evidences of a basaltic, if not of a comparatively recent volcanic overflow; and on that account was regarded by me with considerable interest. The thickness of the overflow was as much as thirty feet above the soil, and seemed also to extend below it.

A mile and a half further, we crossed the *Rio de Zuñi*—its bed at this point being about thirty feet wide, and very miry. We then threaded a cañon of about three hundred yards in breadth, bounded by *mésa* walls of sandstone.

Twelve miles from our last camp, we passed, on our left, the ruins of another old pueblo, the plan of which was about three hundred by four hundred feet. The houses, I noticed, were continuous in structure, originally two stories in height; had been built of flat stones, cemented by mud mortar; and were arranged on the sides of a rectangle, thus making a large interior court. In the centre of the court, I noticed what appeared to have been a square estufa, eighteen by twelve feet in plan, and ten feet in height—its flat roof, or *azotea*, still remaining quite perfect. The floor joists of the houses could still be seen protruding from the walls, in a very good state of preservation; and fireplaces

and chimneys were yet apparent. This pueblo, like those on the Chaco, ranges about north and south, but in the details of its masonry it is far inferior; and in the style of its architecture it resembles not a little that of the Mexicans of the present day. Indeed, the evidences are that it is of a comparatively modern origin. The court-yard, I noticed, had been recently partitioned off into corrals for stock. Fragments of pottery, as usual, lay scattered around. In Doniphan's Expedition, pages 197, 198, I read as follows: "On the head-waters of the *Piscao*, and high up in the mountain, Colonel Doniphan relates that he came to the ruins of an ancient city. Near the ruins are immense beds of vitreous deposit and blackened scoriæ, presenting the appearance of an immense molten lake in the valleys, and other volcanic remains, with chasms and apertures opening down through this stratum of lava to an unknown depth. This vitreous surface, with its sharp asperities, was exceedingly severe on the feet of the mules and horses, wearing them to the quick in a short time. The figure of the city was that of an exact square, set north and south, so that its four sides corresponded with the four cardinal points. In the centre was a large square, or plaza, which, from its appearance, might have been used for military parade-grounds, and for corralling stock in the night time." Query? As the ruins I have just described are the only ones we saw on the head-waters of the *Pescado* (which we followed up to its source) approaching the form of a square, are they not the same as those referred to in the above extract? But we saw nothing of the "extensive molten lake in the valleys, with chasms and apertures opening down through lava to an unknown depth," spoken of as being near the ruins; neither did our animals have their hoofs "worn to the quick in a short time," by travelling over any vitreous surfaces.\*

But to proceed with my journal: There are about the ruins just adverted to some fine springs; and the waters of the *Rio del Pescado* course directly by it, clear and bubbling. The soil in the vicinity exhibits signs of recent cultivation, and appearances indicate that the valley in this quarter was once yet more

\* Some fifty miles east of this locality, on our route to Laguna, we met acres of lava, and extensive fissures; but this was on the head-waters of the Rio San José, a tributary of the Rio Puerco. I never heard, however, that our animals suffered from sore feet.



extensively cultivated. Two miles further brought us to a couple of noble springs, bubbling up, pure and cold, from the foot of some basaltic rocks. These springs seem to be the main sources of the Rio del Pescado, (Rio de Zuñi,) and are called *Los Ojos del Pescado*. Near these springs we are encamped.

Within a few yards of us are several heaps of pueblo ruins. Two of them, on examination, I found to be of elliptical shape, and approximating a thousand feet in circuit. The buildings seem to have been chiefly built on the periphery of the ellipsis, leaving a large interior court; but their style and the details of their construction, except that they were built of stone and mud mortar, are not distinguishable in the general mass. The areas of each are now so overgrown with bushes, and so much commingled with mother earth, as, except upon critical examination, to be scarcely distinguishable from natural mounds. The usual quantum of pottery lies scattered around.

The Governor of Zuñi, who is again on a visit to us, informs us that the ruins I have just described, as also those seen a couple of miles back, are the remains of pueblos which his people formerly inhabited. He has brought to Colonel Washington a finished specimen of the wicker-ware which, both among the Navajos and the Zuñis, I have noticed, in the shape of large bowls and vases. This species of vegetable ware is of so closely-compacted a texture as to hold water, and is superior to anything of the kind I have ever seen in the States. The Zuñi give the *Coyotero* Indians the credit of making them.

The day's march has been 13.71 miles. The route, which has been a gradual ascent, excepting for an inconsiderable portion of it, among some basaltic rocks, and at the crossing of the Rio de Zuñi—neither of these places presenting, however, any formidable impediments—is excellent for wagons. The soil of the valley, which is of an argillo-arenaceous character, is exceedingly fertile. Scrub cedars have dotted the hills, and the artemisia the valleys.

We have met to-day, as we did yesterday, a number of Zuñi Indians carrying bags of wheat upon horses and *burros* (asses) to their pueblo. These people seem to have discovered the principle of industrial accumulation, and therefore of social progress, more than any Indians I have seen.

My astronomical observations place this camp in latitude  $35^{\circ} 5' 12''$ , and longitude  $108^{\circ} 41' 45''$ .

*Bivouac, Inscription Rock, September 17.*—The incidents of to-day have been peculiarly interesting, as the narration of them in their natural order will show:—

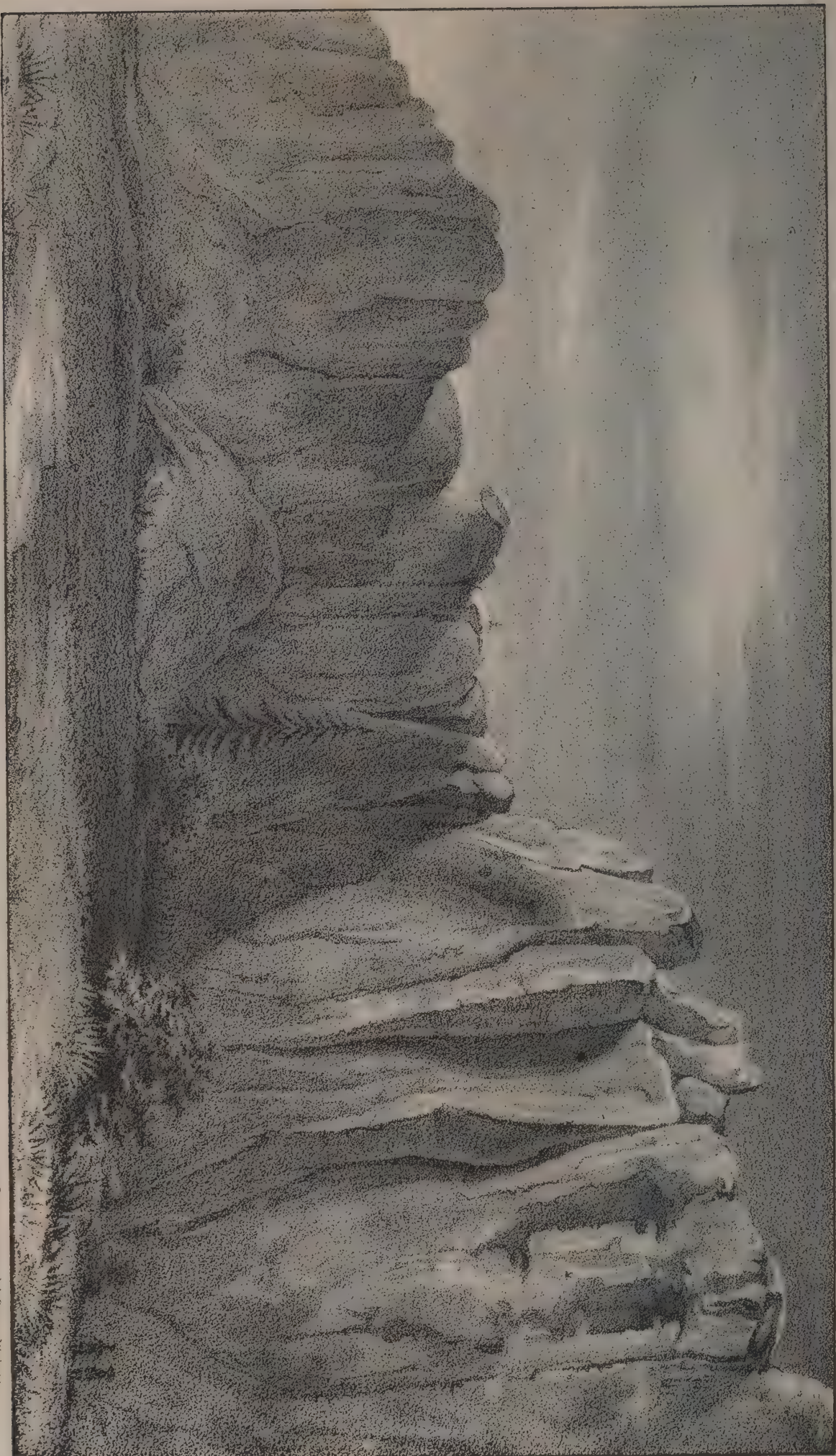
The troops resumed their march at 7 A. M., the course for the day being generally nearly due east, and, for the first three or four miles, up the valley of the Rio de Zuñi. This distance travelled, an extended and beautiful view of handsomely-rounded blue hills or mountain peaks presents itself to the front; low, distant hills being seen on the right, and a champaign country intermediate.

A couple of miles further, meeting in the road Mr. Lewis, who was waiting for me to offer his services as guide to a rock upon the face of which were, according to his repeated assertions, half an acre of inscriptions, many of them very beautiful, and upon its summit some ruins of a very extraordinary character, I at once fell in with the project, and obtained from the colonel commanding the necessary permission. Taking with me one of my assistants, Mr. R. H. Kern, ever zealous in an enterprise of this kind; the faithful Bird, an *employé* who had been with me ever since I left Fort Smith—Mr. Lewis being the guide—and a single pack animal, loaded with a few articles of bedding, a few cooking utensils, and some provisions—we diverged from the command, (see map,) with the expectation of not again meeting it until we should reach the Pueblo of Laguna, from seventy to eighty miles distant. There were many in the command who were inclined to the belief that Lewis's representations were all gammon. In regard to the *extent* of the inscriptions, I could not but believe so too; but, as respects the fact of there being some tolerable basis for so grandiloquent a description, I could not, reasoning upon general principles of human nature, reject it. Mr. Lewis had been a trader among the Navajos, and, according to his statement, had seen these inscriptions in his journeyings to and from their country. And now he was ready to conduct me to the spot. How could I doubt his sincerity? I could not; and my faith was rewarded by the result.

Bearing off slightly to the right from the route of the troops, we traversed for eight miles a country varied, in places, by low *mésas*, blackened along their crests by outcrops of basalt, and







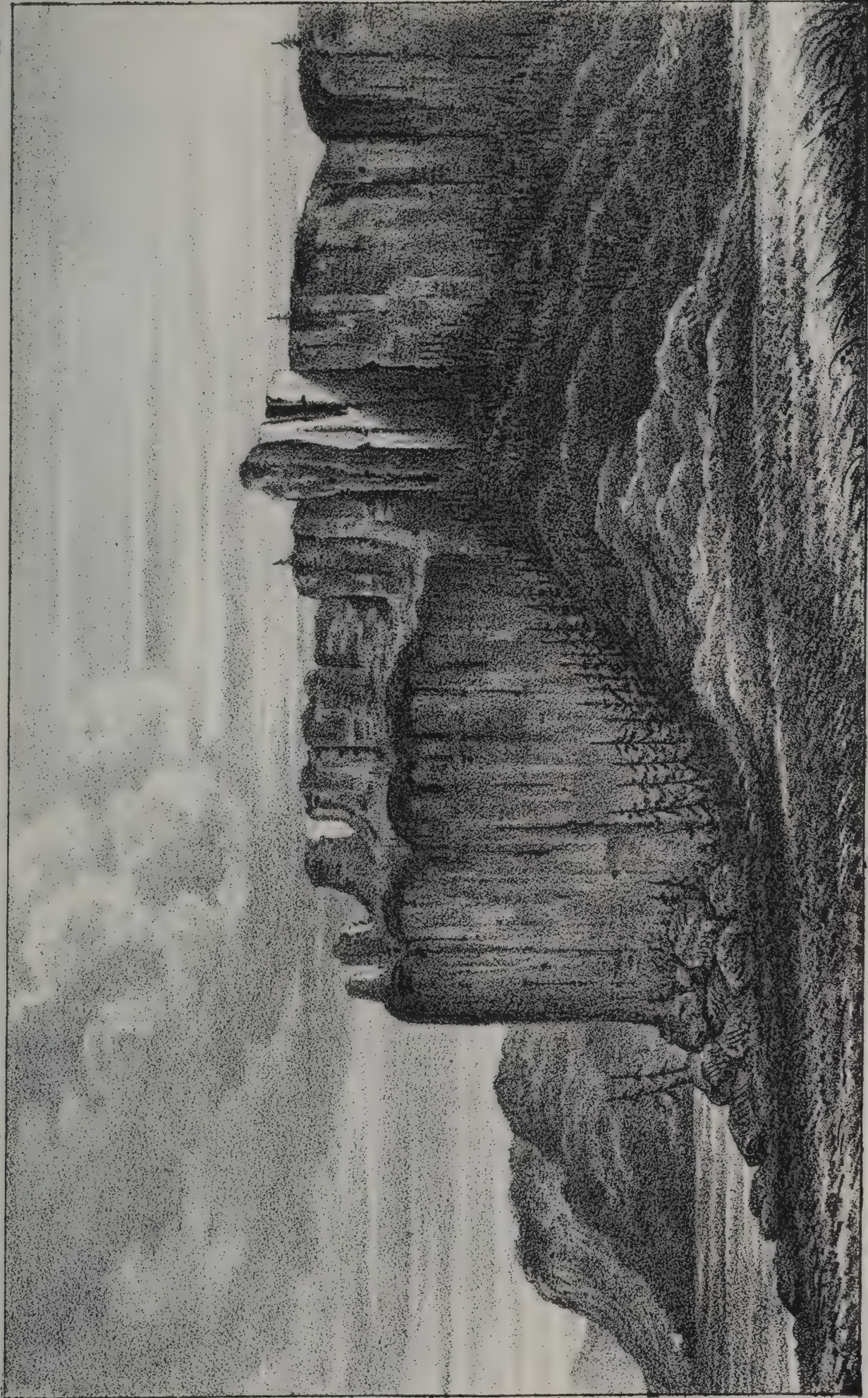
R.H. Kern del.

SOUTH FACE OF INSCRIPTION ROCK

Sept. 17.

P. S. Duval's Museum, Pittsburg, Pa.





R. H. Kern del<sup>t</sup>

NORTH FACE OF INSCRIPTION ROCK.

Sept. 17<sup>th</sup>.

P. S. Duval's Steam lith. press. Phil





on our left by fantastic white and red sandstone rocks, some of them looking like steamboats, and others presenting very much the appearance of façades of heavy Egyptian architecture. This distance traversed, we came to a quadrangular mass of sandstone rock, of a pearly whitish aspect, from two hundred to two hundred and fifty feet in height, and strikingly peculiar on account of its massive character and the Egyptian style of its natural buttresses and domes. Skirting this stupendous mass of rock, on its left or north side, for about a mile, the guide, just as we had reached its eastern *terminus*, was noticed to leave us, and ascend a low mound or ramp at its base, the better, as it appeared, to scan the face of the rock, which he had scarcely reached before he cried out to us to come up. We immediately went up, and, sure enough, here were inscriptions, and some of them very beautiful; and although, with those which we afterwards examined on the south face of the rock, there could not be said to be half an acre of them, yet the hyperbole was not near so extravagant as I expected to find it. The fact then being certain that here were indeed inscriptions of interest, if not of value, one of them dating as far back as 1606, all of them very ancient, and several of them very deeply as well as beautifully engraven, I gave directions for a halt—Bird at once proceeding to get up a meal, and Mr. Kern and myself to the work of making *fac-similes* of the inscriptions.

These inscriptions are, a part of them, on the north face of the rock, (see Plate 60,) and a part on the south face, (see Plate 61.) *Fac-similes* of those on the north face, drawn to a given scale, will be found in Plates 65, 66—1, 66—2, 67—1, 67—2, 67—3, and 68, the order of enumeration being that of their relative position from east to west, and the strength or weakness of the letters in the drawing, as well as the complexion of the rock, being an imitation of them as we found them on the rock. *Fac-similes* of the inscriptions on the south face will be found in Plates 69, 70, 71, 72, 73, and 74.

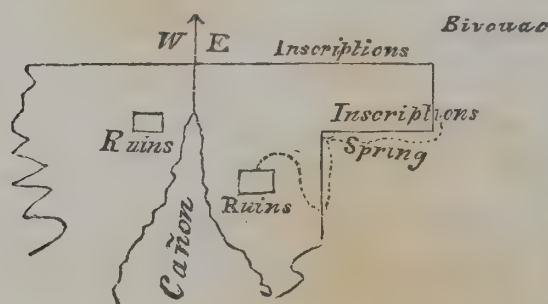
It will be noticed that the greater portion of these inscriptions are in Spanish, with some little sprinkling of what appeared to be an attempt at Latin, and the remainder in hieroglyphics, doubtless of Indian origin.

The face of the rock, wherever these inscriptions are found, is of a fair plain surface, and vertical in position. The inscriptions, in most instances, have been engraved by persons stand-

ing at the base of the rock, and are, therefore, generally not higher than a man's head.

The labor of copying the inscriptions having employed us from about noon till near sunset, and there yet being more than enough to keep us at work for the balance of the day, we suspended copying the remainder till the morrow, in order that before dark we might visit the "wonderful ruins" Lewis had assured us we would find on the summit of the rock. So, taking him as our guide, we went around to the south face of the wall, along which we continued until we came to an angle, thus:—

*Plan of Rock.*



where, canopied by some magnificent rocks, and shaded by a few pine trees, the whole forming an exquisite picture, (see sketch in Plate 62,) we found a cool and capacious spring—an accessory not more grateful to the lover of the beautiful than refreshing to the way-worn traveller. Continuing along the east face of the rear projection or spur of the rock a few yards further, we came to an accessible escarpment, up which we commenced our ascent, the guide taking off his shoes to enable him to accomplish it safely. After slipping several times, with some little apprehension of an absolute slide off, and a pause to take breath, we at last reached the summit, to be regaled with a most extensive and pleasing prospect. On the north and east lay stretching from northwest to southeast the *Sierra de Zuñi*, richly covered with pine and cedar; to the south could be seen gracefully-swelling mounds and distant peaks, beautifully blue on account of remoteness; to the west appeared the horizontal outline of *mésa* heights, with here and there a break, denoting an intervening cañon or valley; and lying between all these objects and my point of view was a circuit of prairie, beautifully tasty on account of solitary and clustered trees, or sombrously dark on account of low *mésa* and oblong ridges covered with cedars.





R.H. Kern delt.

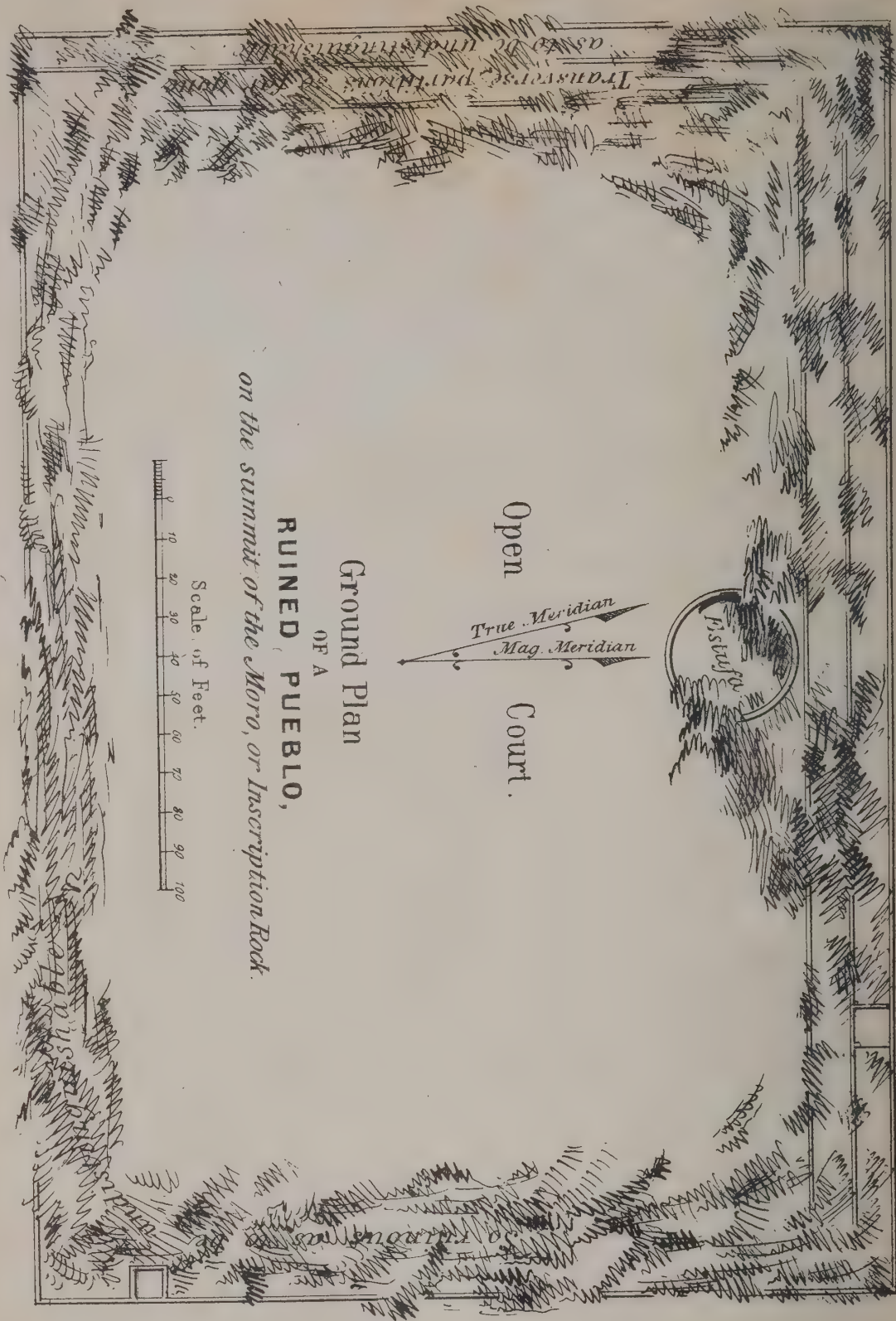
P. S. Duval's Steam lith. Press. Philad.<sup>a</sup>

SPRING AT INSCRIPTION ROCK.









R. H. Kern. del.

P. S. Duval Steam Lith. Press Phila.



R.H.Kern del<sup>d</sup>

Printed in Colours by P.S. Duval's Steam lith. Press Philad. #

POTTERY FOUND AT THE PUEBLO,  
on the summit of the Muro or Inscription Rock.





This extensive scene sufficiently scanned, we proceeded to examine the ruins which the guide, true to his word, pointed out immediately before us. These ruins present, in plan, a rectangle two hundred and six by three hundred and seven feet, the sides conforming to the four cardinal points. The apartments seem to have been chiefly upon the contour of the rectangle, the heaps of rubbish within the court indicating that here there had been some also. (See ground plan in Plate 63.) There appear to have been two ranges of rooms on the north side, and two on the west. The other two sides are in so ruinous a condition as to make the partition-walls indistinguishable. On the north side was found traceable a room seven feet four inches by eight and a half feet; and on the east side, one eight and a half by seven feet. There was one circular *estuffa* apparent, thirty-one feet in diameter, just in rear of the middle of the north face. The main walls, which, except for a length of about twenty feet, were indistinguishable, appear from this remnant to have been originally well laid—the facing exposing a compact tabular sandstone varying from three to eight inches in thickness, and the backing a rubble kind of masonry, cemented with mud mortar. (See facing depicted in drawing No. 3, Plate 41.) The style of the masonry, though *next*, as far as our observation has extended, to that of the pueblos of Chaco, in the beauty of its details, is far inferior. Here, as usual, immense quantities of broken pottery lay scattered around, and of patterns different from any we have hitherto seen. (See Plate 64.) Indeed, it seems to me that, to have caused so much broken pottery, there must have been, at some time or other, a regular sacking of the place; and this, also, may account for this singular phenomenon being a characteristic of the ancient ruins generally in this country. At all events, we see nothing of this kind around the inhabited pueblos of the present day, in which pottery is still much used; and I can see no reason why, if their inhabitants were of their own accord to desert them, they should go to work and destroy the vessels made of this kind of material.

To the north of west, about three hundred yards distant, a deep cañon intervening, (see plan of rock, &c., above,) on the summit of the same massive rock upon which the inscriptions are found, we could see another ruined pueblo, in plan and size apparently similar to that I have just described. These ruins,

on account of the intervening chasm, and want of time, we were not enabled to visit.

What could have possessed the occupants of these villages to perch themselves so high up, and in such inaccessible localities, I cannot conceive, unless it were, as it probably was, from motives of security and defence.

The idea has been generally entertained, and I notice Gregg gives currency to it, that a portion of the ruins of this country are "at a great distance from any water, so that the inhabitants must have entirely depended upon rain, as is the case with the *Pueblo of Acoma* at the present day."\*

Near all the ruins I have yet seen in this country, I have most generally found water; and in those cases where there was none, the dry bed of a stream, in convenient proximity, gave sufficient evidence that even here, in times past, there was a supply. Besides, there are at the present day Mexican ruins to which the inhabitants now point as having been deserted not many years ago on account of the creeks near them failing. Such, for instance, is the Mexican village called *Rito*, (which we subsequently passed,) on the San José—its Roman Catholic church and other buildings conclusively attesting that it had been deserted not many years back.

As regards the inhabitants of Acoma at the present day relying, as Gregg states, for water upon the rains, his information must have been from report; for Abert expressly tells us the contrary. His language is (he is speaking of Acoma and its vicinage): "We had encamped by the side of some holes that the Indians had dug; these, they said, yielded a constant supply of water; and between our camp and the city there was some water that ran along the bed of a stream for a few yards, when it disappeared beneath the sand. This furnished the inhabitants with drinking water."† Besides, I doubt very much if in this country the water that could be collected from rains by any artificial process would be near sufficient to answer the wants of the people. I doubt it, for the reason that the chief sources of supply to the streams appear not to be from the rains—few and scant—which fall upon the plains, but from the rains which are produced by, and break, upon the mountains.

\* Commerce of the Prairies, vol. 1, p. 284.

† Lieutenant Abert's Report on New Mexico, 1846-47, October 21.



But to continue my journal. The shades of evening falling upon us in our labors, we were constrained to retrace our way down to the plain; and it was not long before we were at the base of the rock, hovering over a bivouac fire, eating our suppers, and talking over the events of the day—the grim visage of the stupendous mass behind us occasionally fastening our attention by the sublimity of its appearance in the dim twilight.

*Twenty-eighth camp, Ojo del Gallo, September 18.*—The excitement of yesterday's discovery, together with rather a hard pallet, and the howling of the wolves, prevented my having as comfortable a night's rest as I would have liked. Often did I gaze, in my restlessness, *au ciel*, to witness the culmination of that beautiful constellation, Orion, the precursor, at this season of the year, of the approach of day; and as often did I find myself obliged to exercise that most difficult of virtues, patience—the sure key, with the proper application of subordinate means, to success.

The dawn of day at 3 o'clock appearing, we got up, for the purpose of hastening breakfast, in order that, by daylight, we might be ready to continue our labors upon the inscriptions. Besides, finding that, to reach the rock yesterday, our divergence from the route of the troops had been but about three miles, and being anxious to join the command to-night, in order that I might keep up the proper succession of astronomical positions, (my instruments being with the troops,) I felt desirous to hasten our work, so that I might effect the object.

Our breakfast over, the day opening beautifully, and the feathered race regaling us—an unusual treat—with their gay twittering, we hastened to the work of finishing the *fac-similes*. These completed, and Mr. Kern having engraved as follows upon the rock: "Lt. J. H. Simpson, U. S. A., and R. H. Kern, artist, visited and copied these inscriptions, September 17, 1849," we found ourselves ready by 8 o'clock to commence our journey to overtake the command.

A large number of the hieroglyphics, (on the south side of the rock,) and many names and dates, are evidently—from the in some cases faint, and in others interrupted or broken, appearance of the inscriptions—gone; and for this cause, as well as from an occasional failure in the perfect engraving of a letter, and there-

fore its assimilation in appearance to others nearly resembling it in form, the *fac-similes*, though, as a whole, generally transcriptive of the letters or words intended by the inscribers, in some few instances are, doubtlessly, variant from the exact orthography intended, and therefore difficult to be deciphered. A *literal* rendering of them into English, so far as I have been able to have it accomplished, by the conjoint assistance of Chief Justice J. Houghton, Señor Donaciano Vigil, secretary of the province, and Mr. Samuel Ellison, the official translator, will be found below. I prefer to give them literally, because it is the most faithful mode of translation; and though the sense, in some instances, might be given in better English, yet, for the sake of accuracy, and because the meaning is apparent under a literal translation, I think it best to present them in this form as follows:—

PLATE 65.

“Augustin de Hinojos.”

“In the year 1641, Bartolome Romelo,” (here words not decipherable.)

“In the year 1716, upon the 26th day of August, passed by this place Don Feliz Martinez, Governor and Captain General of this kingdom, for the purpose of reducing and uniting Moqui,” (a couple of words here not decipherable.)

“Licentiate Chaplain Friar Antonio Camargo, Custodian, and Ecclesiastical Judge.”

“Simon de Salas.”

“Antonio Nomoya.”

PLATE 66—1, 2.

“On the 28th day of September, of the year 1737, arrived at this place Batchelor Don Juan Ignacio de Arrasain.”

“Passed by this place Diego Belasques.”

“On the 28th day of September, of the year 1737, arrived at this place the Illustrious Doctor Don Martin De Liza Cochea, Bishop of Durango, and on the 29th left for Zuñi.”

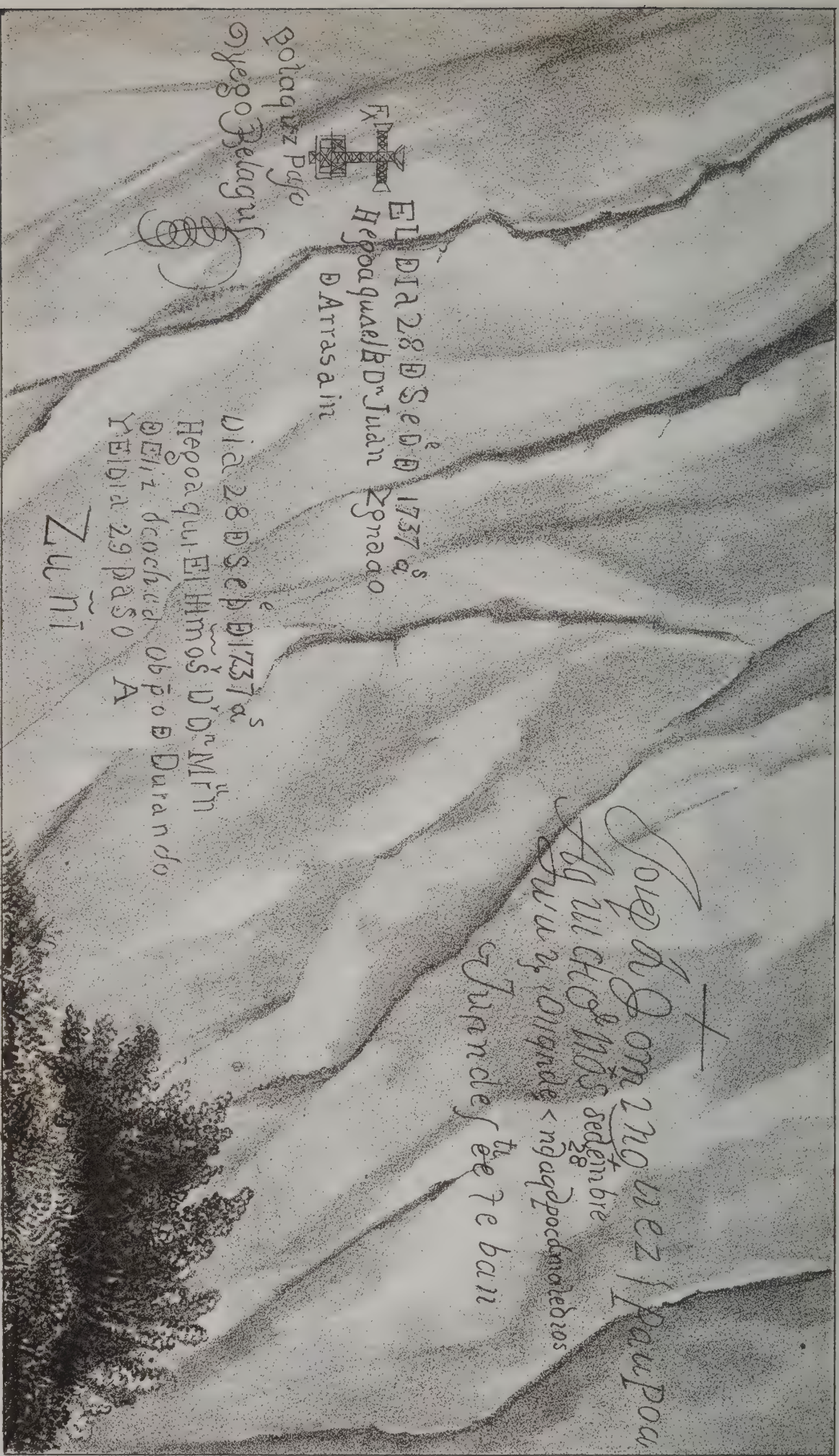
“Joseph Dominguez passed by this place in October, and others September 28, with much caution and some apprehension.”

“Juan de San Esteban.”

“Puilanuis.”







+  
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 duw. y. diquide < nqag pcedmatedios  
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EL DIA 28 DE SEPT 1737 a.  
 Heoagual BD Juan Zynao  
 D Arrasain

go laq uz Payo  
 0 yego Belagus

DIA 28 DE SEPT 1737 a.  
 Heoagual El Himos D. D. M. n.  
 DE iz deoched ob p o d Durando  
 Y EL DIA 29 PASO A  
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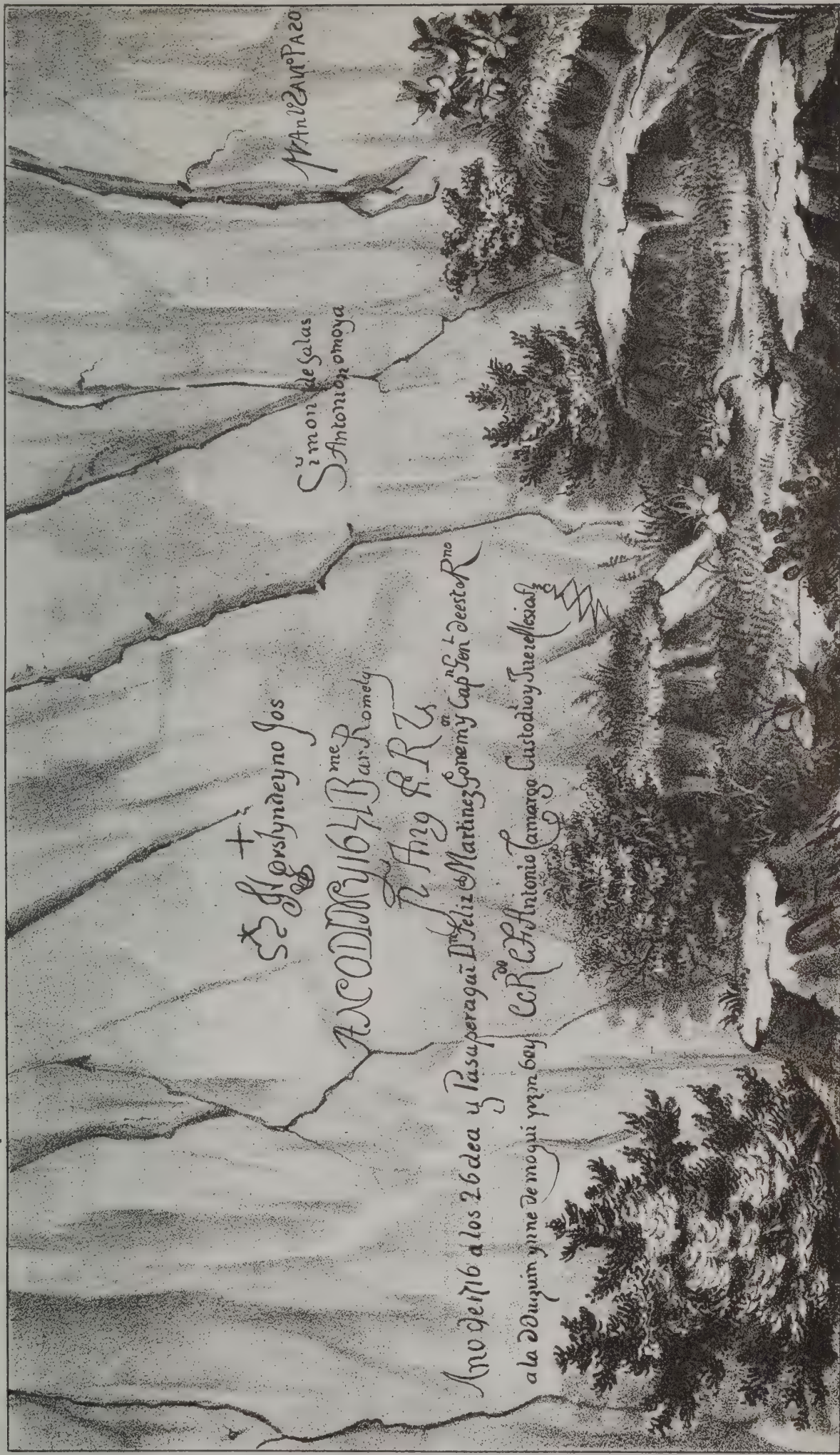
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INSCRIPTIONS ON NORTH FACE OF INSCRIPTION ROCK.

Scale of feet.  
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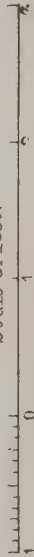


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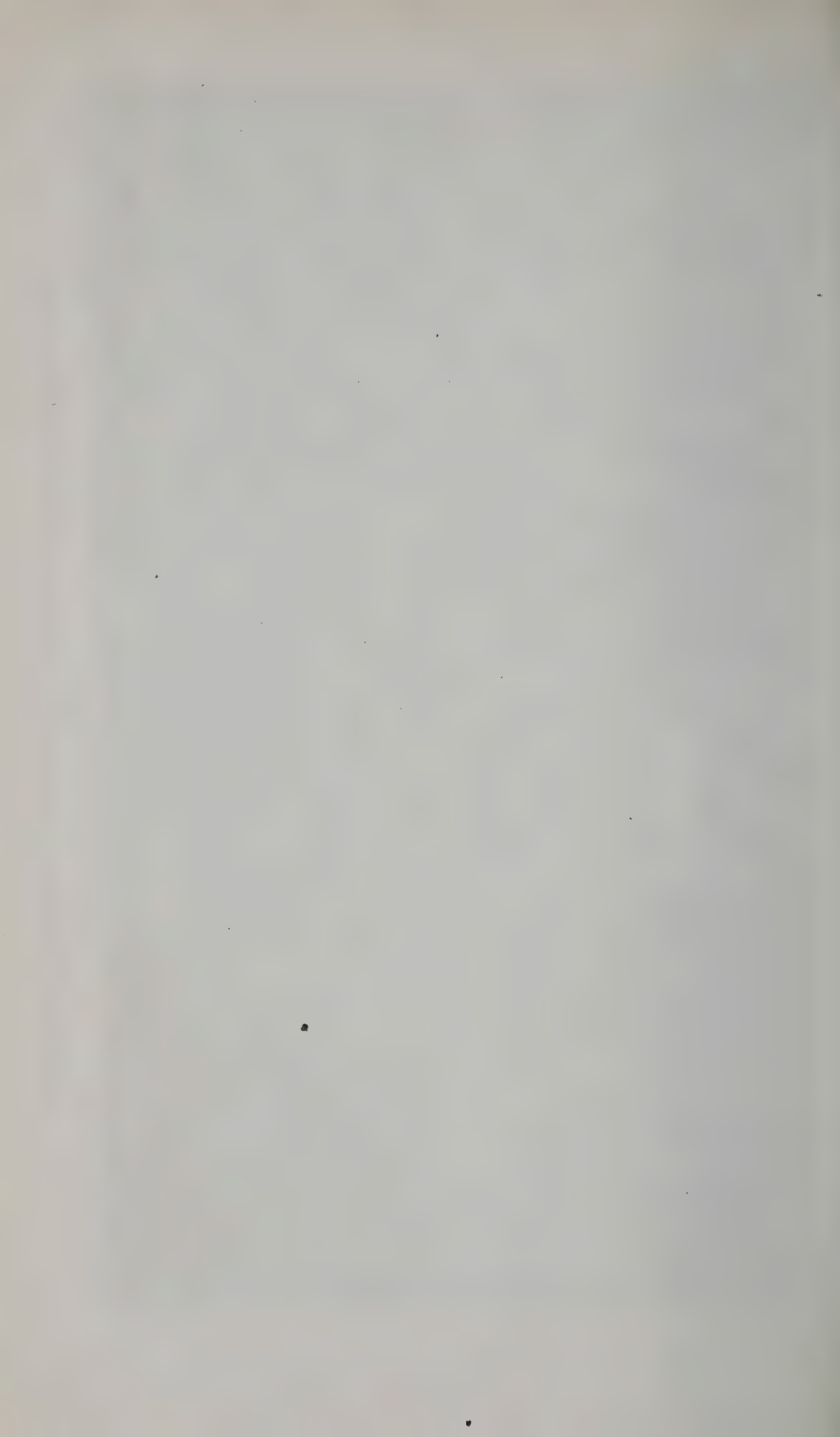
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# INSCRIPTION ON NORTH FACE OF INSCRIPTION ROCK

Scale of feet.

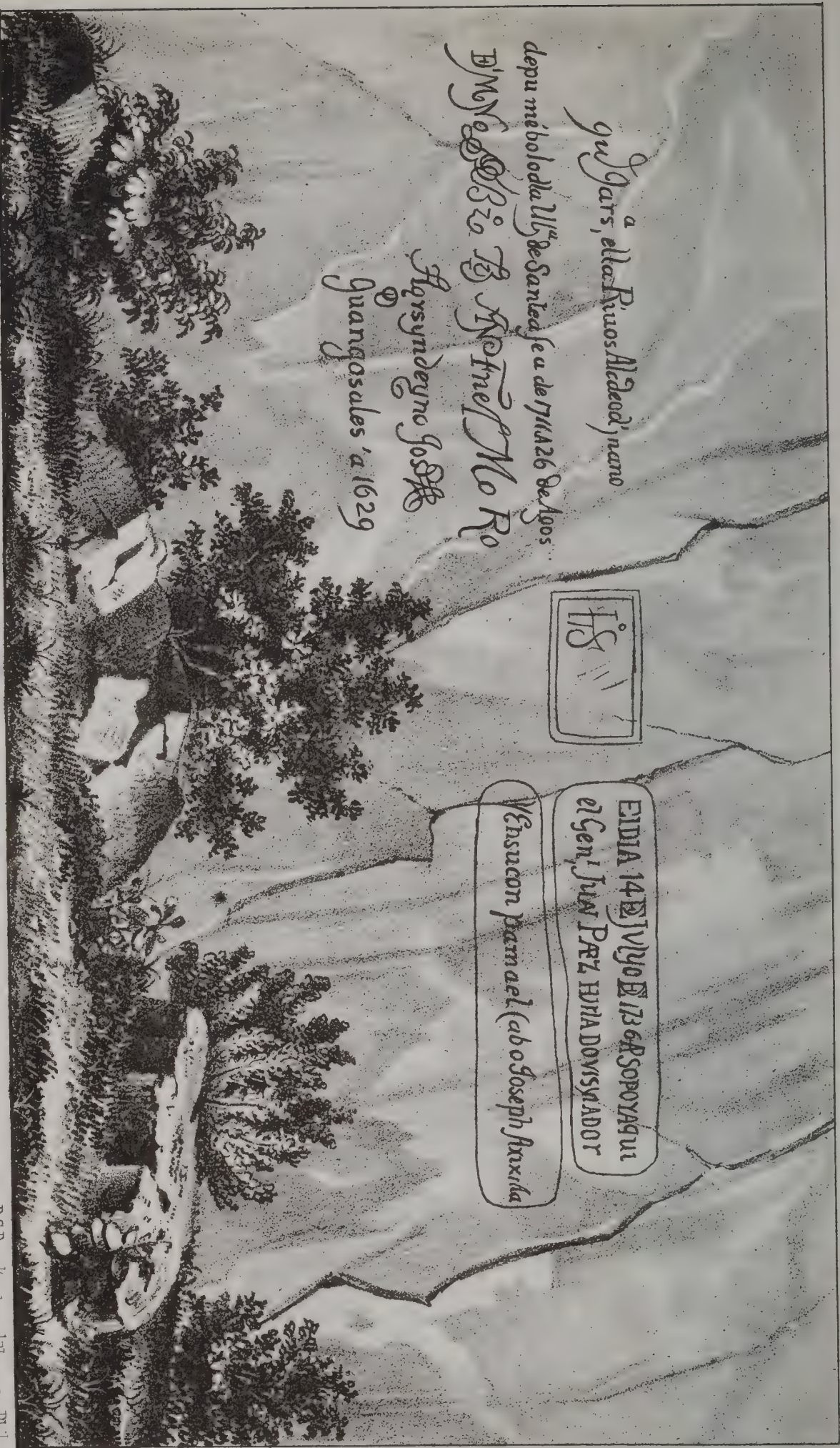


P. S. Duval's steam lith press Phil.









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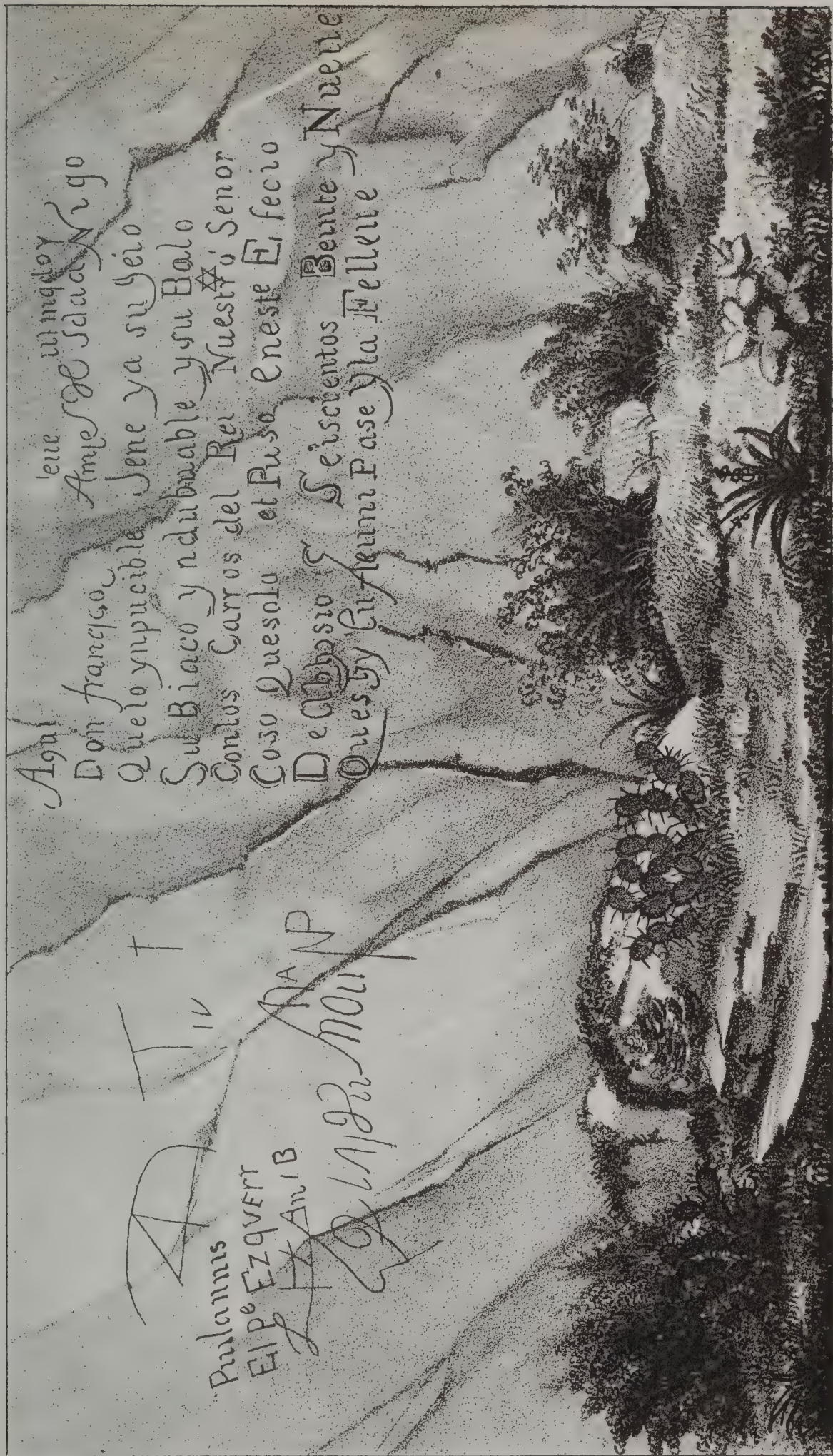
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P. S. Duval's steam lith. press, Phil.

INSCRIPTIONS ON NORTH WALL OF INSCRIPTION ROCK





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Don Francisco  
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Su Biaco y ndubable y su Balo  
Conlos Carros del Rei Nuestró Senor  
Coso Quesola et Pusa eneste E fecio  
De Abbasio S Seiscientos Bernte y Nueve  
Ouesby Gu Aum Pase y la Telleite

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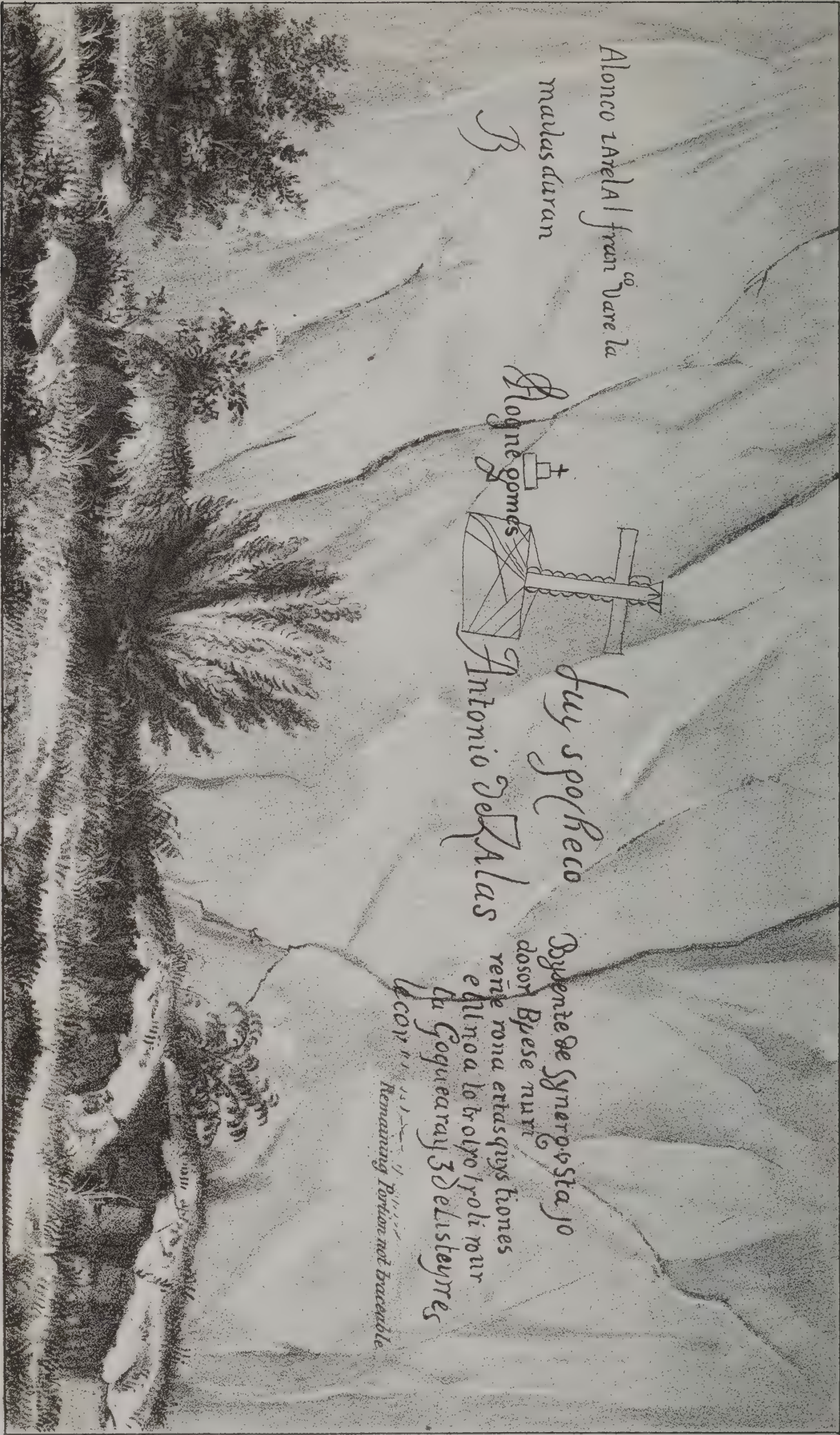
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INSCRIPTIONS ON NORTH FACE OF INSCRIPTION ROCK.











Alonso Varela from Varela  
malas duran

3

Alonso Gomes

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R. H. Kern del.

N. 3.

INSCRIPTIONS ON NORTH WALL OF INSCRIPTION ROCK

E. J. Duval's stream with press Phil









"The Father Ezquerr."

"Antonio B\*\*\*," (this name not decipherable.)

(Here a word or two not decipherable.) Don Francisco, (a word or two not decipherable,) for the impossibility—*Jene*—there to subject; his arm undoubted, and his valor, with the wagons of our Lord the King, a thing which he alone did—*Efecio de Abtosio*—six hundred and twenty-nine, (probably intended for 1629.) *Quesby Eu Aeuni Pase y la Felleue.*"

PLATE 67—1, 2, 3.

"Juan Garcia de la Rivâs, Chief Alcalde, and the first elected of the town of Santa Fé, in the year 1716, on the 26th of August. By the hand of Bartolo Fernandez Antonio Fernandez Moro."

"Augustin de Ynojos."

"Juan Gonzales, year 1629."

(The characters in the double rectangle seem to be literally a sign-manual, and may possibly be symbolical of Francisco Manuel; though the double thumb would appear to indicate something more.)

"On the 14th day of July, of the year 1736, passed by this place General Juan Paez Hurtador, Inspector; and in his company Corporal Joseph Armenta, Antonio Sandobal Martines, F. Guapo, Alonzo Barela, Marcus Duran, Francisco Barela, Louis Pacheco, Antonio de Salas, Roque Gomas."

"Vicente de Sinorgosta and (name not decipherable) fought on account of these questions," (the remainder not intelligible, except that *lecor*—probably intended for *licor*, liquor—seems to have had something to do with the quarrel.)

"Joseph Ramos."

"Diego Nunez Bellido."

"Diego."

"Friar Zapata."

"Bartolome Naranjo."

"Governor and Captain General of the Provinces of New Mexico, for our Lord the King, passed by this place, on his return from the Pueblo of Zuñi, on the 29th of July, of the year 1620, and put them in peace, at their petition, asking the favor to become subjects of his Majesty, and anew they gave obedience;

all which they did with free consent, knowing it prudent, as well as very Christian, (a word or two effaced,) to so distinguished and gallant a soldier, indomitable and famed, we love ;" (the remainder effaced.)

## PLATE 68.

"Antonio Gon Salez, in the year 1667. (Some characters not decipherable.) Country of Mexico, in the year 1632, folio (some characters not intelligible,) Bengoso, by order of Father Lébado Lujan."

## PLATE 69.

"Passed by this place with despatch, (a word or two not decipherable,) 16th day of April, 1606."

"Cayado, 1727."

"I. Aparela, 1619." (Hieroglyphics not decipherable.)

## PLATE 70.

"Passed by this place Sergeant Major and Captain Juan Archuleta, and the traveller Diego Martin Barba and Second Lieutenant Juan Ynes Josano, in the year 1636." (Hieroglyphics not decipherable.)

## PLATE 71.

"Here served General Don Diego de Bargas, to conquer to Santa Fé, for the royal crown, New Mexico, by his own cost, in the year 1692."

"By this place passed Second Lieutenant Joseph de Payba Basconzelos, in the year in which the council of the kingdom bore the cost, on the 18th of February, in the year 1726."

## PLATE 72.

"In the year 1696 passed D. M." (Hieroglyphics not decipherable.)

## PLATE 73.

"P. Joseph de la Candelaria."

"O. R., March 19, 1836." (These are the only initials with





R H Kern, Jr.

SE  $\bar{P}^{\text{sa}}$  AZ  $\bar{D}^{\text{sa}}$  1632 f.  
 AC A B en  $\bar{D}^{\text{so}}$   $\bar{M}^{\text{so}}$   $\bar{D}^{\text{so}}$   $\bar{P}^{\text{so}}$   $\bar{L}^{\text{so}}$   $\bar{E}^{\text{so}}$   $\bar{B}^{\text{so}}$   $\bar{A}^{\text{so}}$

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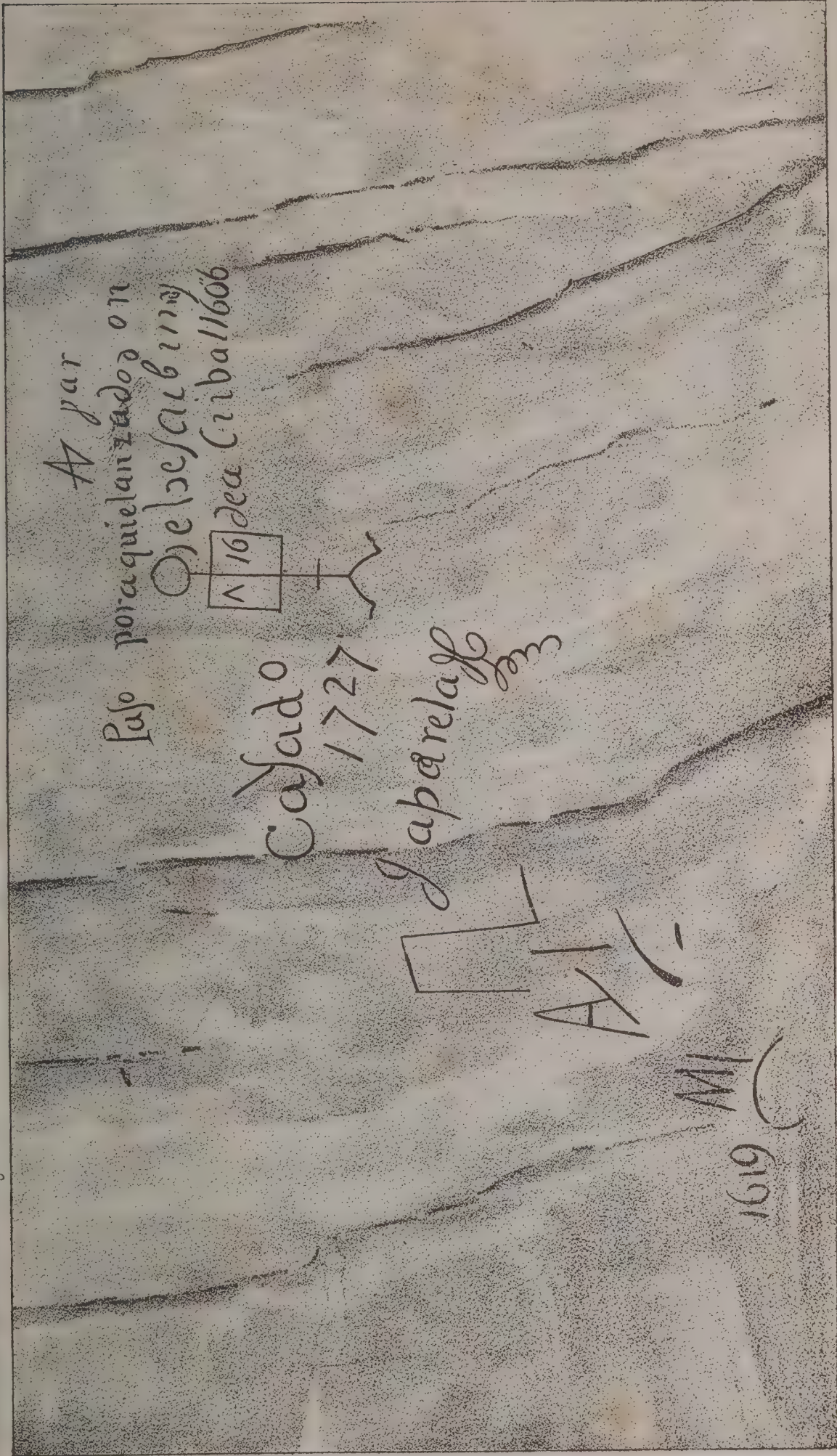
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INSCRIPTIONS ON NORTH FACE OF INSCRIPTION ROCK

Sept. 17

P. S. Duval, steam lith. press. for





P. S. Duval's Steam Lith. Press Phila

P. H. Kern del

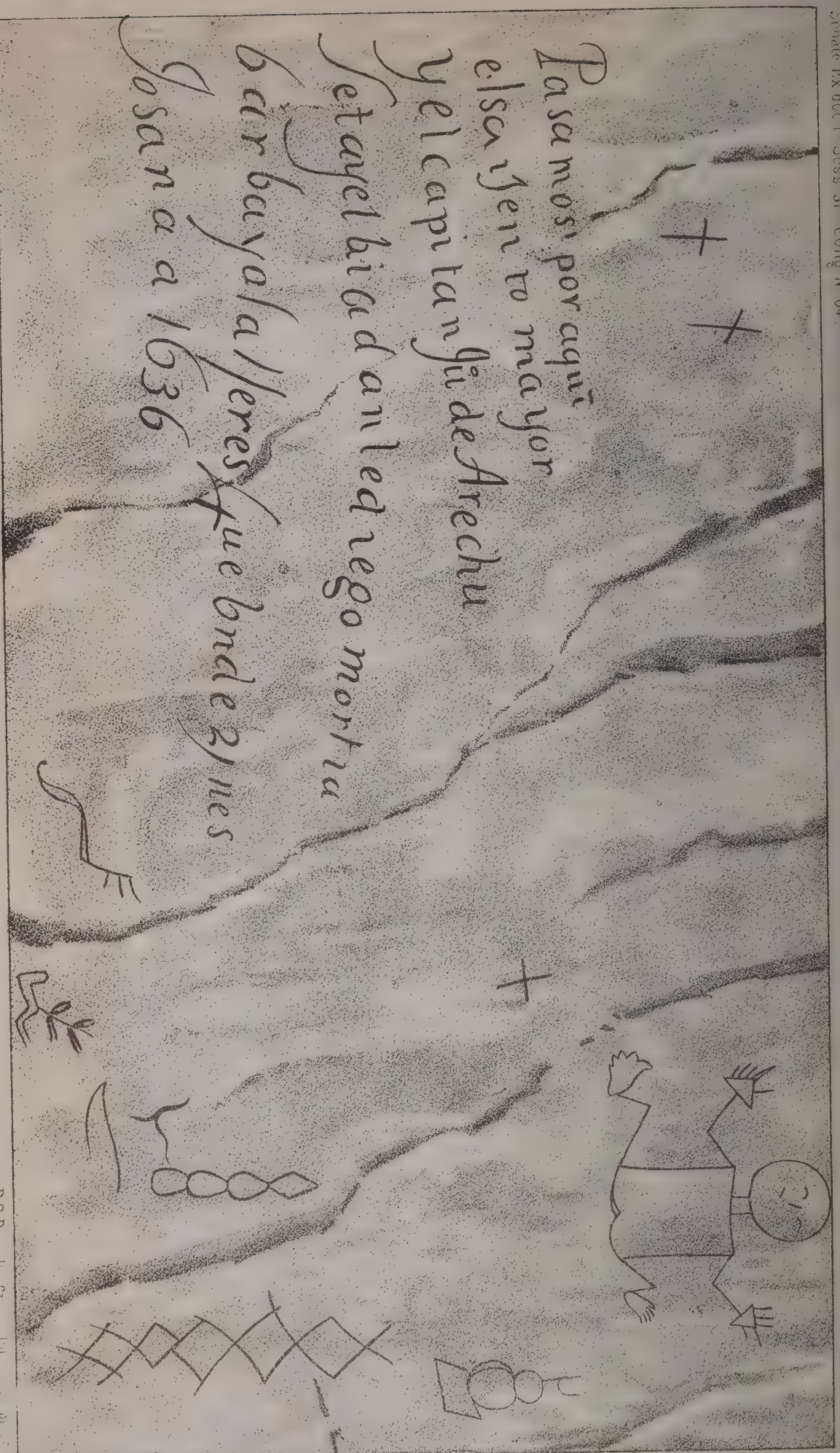
INSCRIPTIONS ON SOUTH FACE OF INSCRIPTION ROCK

Sept. 17.









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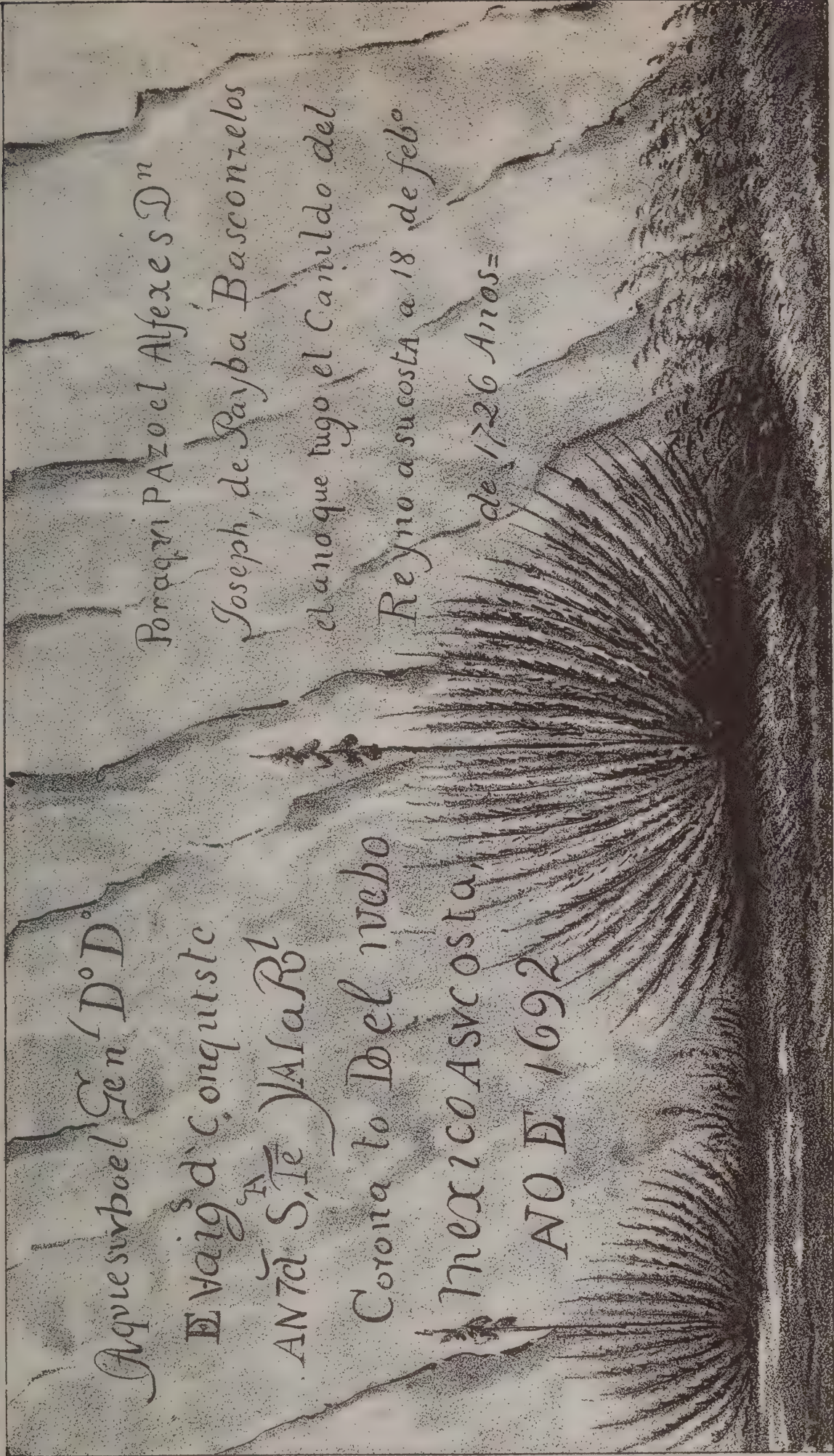
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INSCRIPTIONS ON SOUTH FACE OF INSCRIPTION ROCK.

Sept. 17.





Aguirreboel Gen<sup>l</sup> D<sup>o</sup> D<sup>o</sup>

Evaig d'Conquistac

AN<sup>7</sup>al S<sup>te</sup> Alar<sup>1</sup>

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Joseph, de Payba Basconzelos

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Drawn by R H Kern from Copies made by L<sup>t</sup> Simpson U.S.A.

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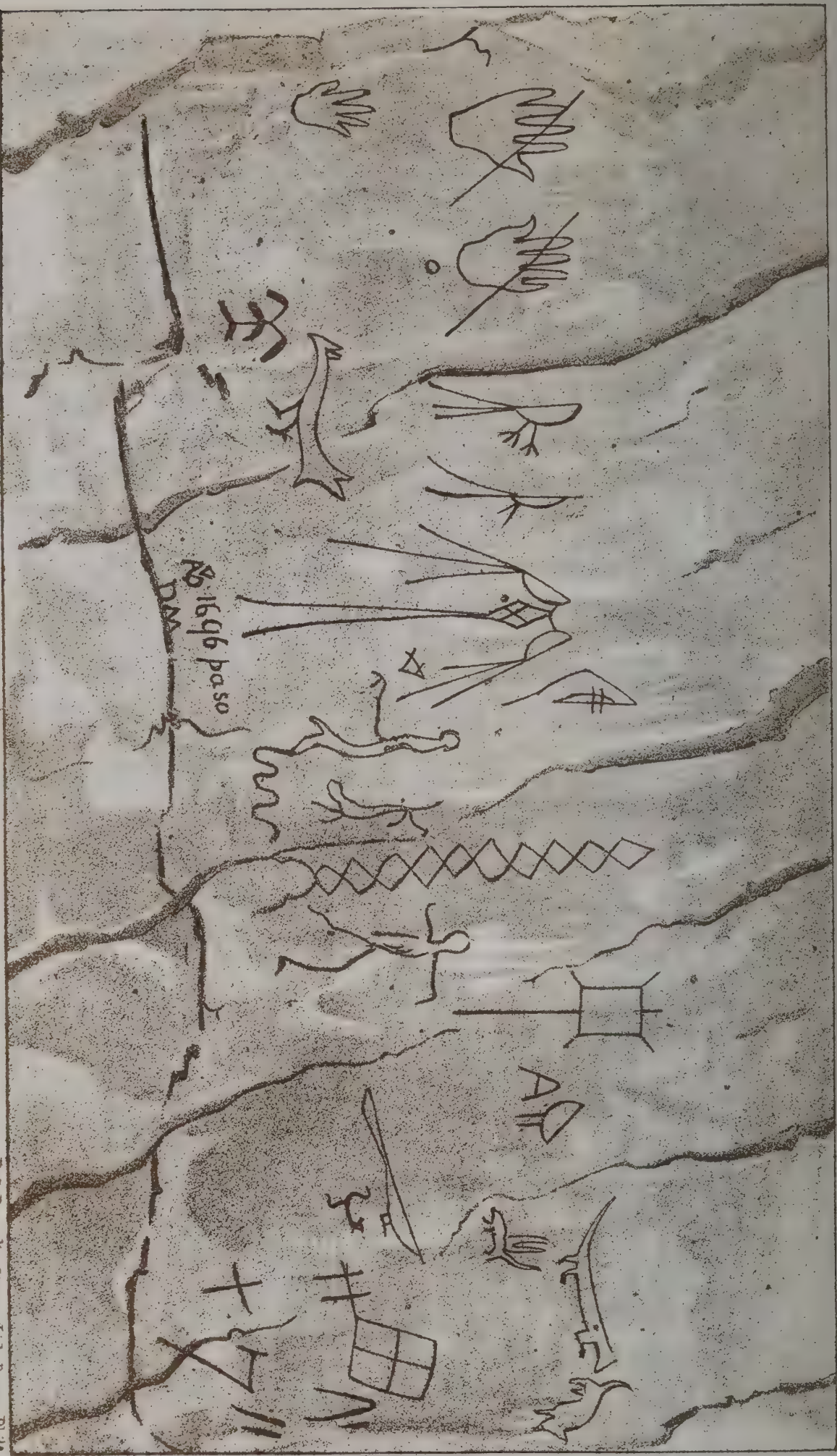
INSCRIPTIONS ON SOUTH FACE OF INSCRIPTION ROCK.

Sept 17.









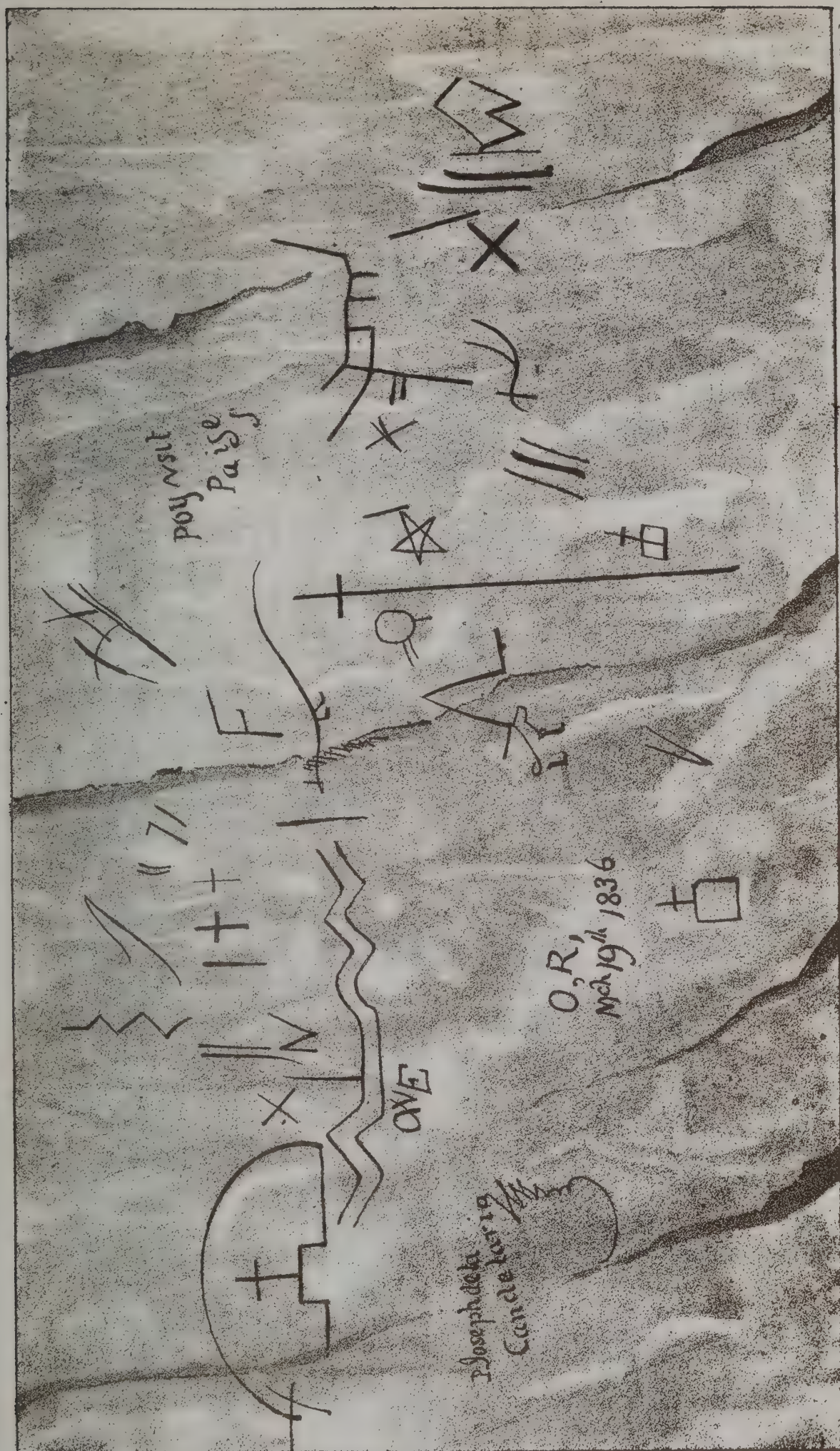
R. H. Kern del<sup>t</sup>

P. S. Duval's Stearn Lith Press, Phila.

PICTOGLYPHS ON SOUTH FACE OF INSCRIPTION ROCK.

Sept 17





R. H. Kern del<sup>t</sup>

P. S. Duval's Steam Lith. Press Phil

# HIEROGLYPHICS ON SOUTH FACE OF INSCRIPTION ROCK

Sept. 17.





an English date before Mr. Kern engraved ours. The hieroglyphics not decipherable.)

## PLATE 74.

“Piro Vacu (possibly intended for *vaca*—cow) ye Jarde.”

“Alma.”

“Leo.”

“Captain Jude Vubarri, in the year of our Lord 1,” (probably meaning 1701. The hieroglyphics, excepting what appears to designate a buffalo, not decipherable.)

The translations of the several inscriptions, so far as it has been possible to have them effected, having now been given, I introduce, in this connection, a letter from the secretary of the province, (received since the expedition,) by which it will be perceived that two of the persons whose names are inscribed—General Don Diego de Bargas, and General Juan Paez Hurtador—have been governors of New Mexico. This letter is also interesting on account of the other historical facts which it divulges. For its translation, I am indebted to Chief Justice Houghton:—

“SANTA FÉ, *October* 19, 1849.

“SIR: The engravings which are sculptured on the rock of Fish Spring, near the Pueblo of Zuñi, copies of which you have taken, were made in the epochs to which they refer. I have an indistinct idea of their existence; but, although I have passed the place some three times, I never availed myself of the opportunity to observe them. The other signs or characters noticed are traditional remembrances, by means of which the Indians transmit historical accounts of all their remarkable successes. To discover these acts by themselves, is very difficult. Some of the Indians make trifling indications, which divulge, with a great deal of reserve, something of the history, to persons in whom they have entire confidence.

“The people that inhabited this country before its discovery by the Spaniards were superstitious, and worshipped the sun.

“I would be glad to relate to you, with exactness, events which are passed; but I am deprived of this satisfaction from

the want of certain information in regard to the particulars, because some of them occurred a very few years after the conquest made by Juan de Oñate, in the year 1595; and all records preceding the year 1680 are lost, as the Indians burnt the archives in their insurrection against the conquerors who then occupied the country.

“In 1681, Governor Antonio de Otermin received orders from the viceroy to return and conquer. He made his entrance to the Pueblo of Cochiti, encountered resistance, and, on account of the small force he brought, retired to El Paso in the same year. Garbaceo de Cruzat y Gongora succeeded him in command, and also remained established at El Paso.

“In the following year, Cruzat made an expedition against New Mexico, took possession of the capital, and extended his conquests a little more effectually, until the following year; when, it being impossible for him to sustain himself longer, he returned to El Paso.

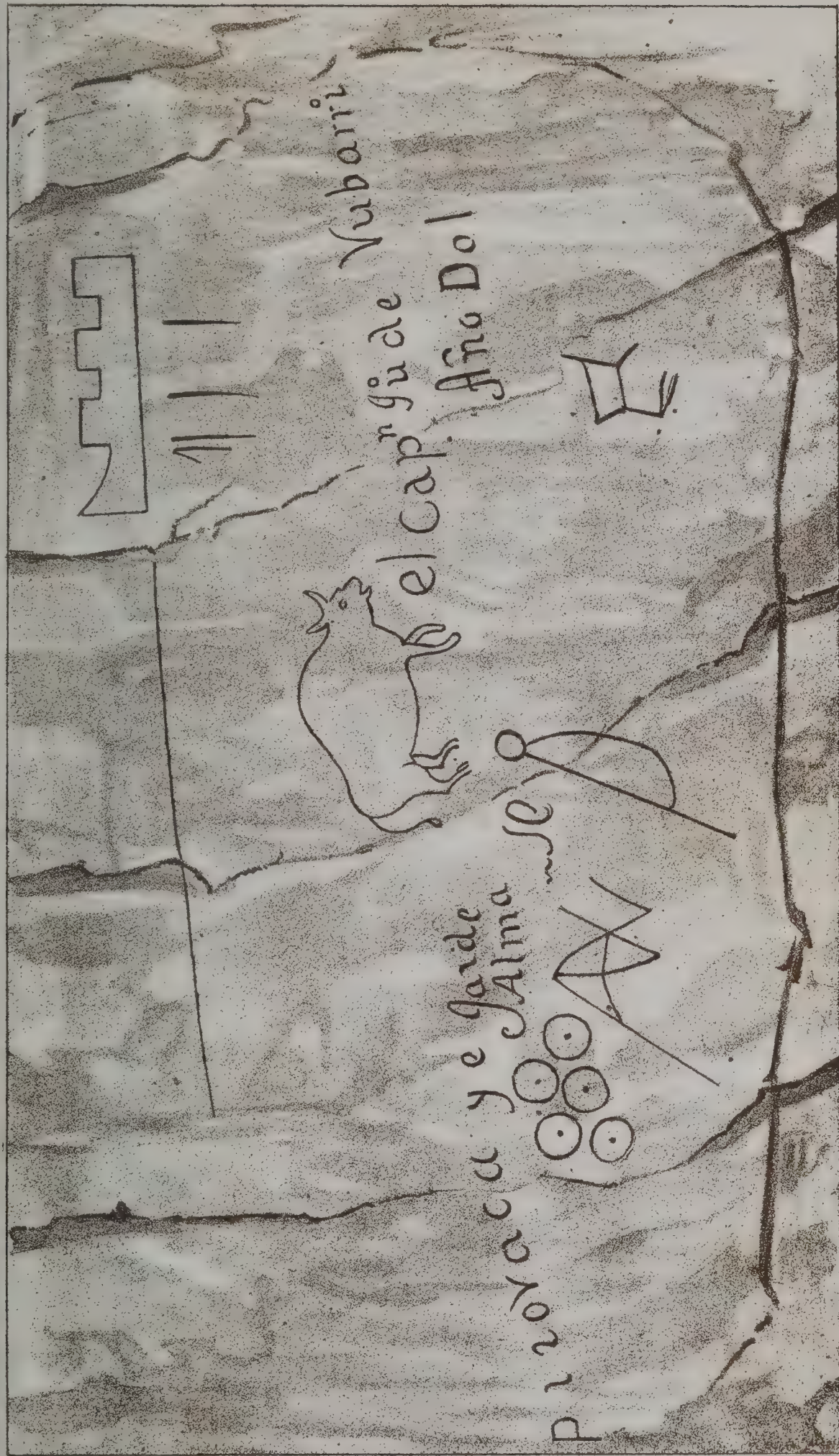
“In the year 1693,\* Curro Diego de Bargas Zapata penetrated as far as the Pueblo of Zuñi, and, without proceeding further, returned to El Paso. In the year 1695, he obtained the entire pacification of the country.

“There were afterwards a succession of governors, among whom are numbered Feliz Martinez, Juan Paez Hurtado, and many others, of whom can be produced exact information by referring to the time of the administration of each, according to the registry in the ancient archives of the government. The short time before your departure does not afford the necessary opportunity to register and give to you an historical relation of these events. This account, therefore, should not be regarded by you as one which should direct your idea entirely, for my limited leisure does not permit me to search into all the particulars necessary, but it may serve you as a certain guide to direct the history, the events being marked in chronological order.

“Should these remarks prove useful to you, and I have facility of access to the archives, as I have now, I will with pleasure

\* According to the extract from De Bargas' journal already given in a note under the head of the twenty-fifth camp, his conquest of Zuñi bears date November 11, 1692, and this year corresponds with that inscribed on the rock.





R.H. Kern del.

P.S. Duval's Steam Lith. Press. Phil.

INSCRIPTIONS ON SOUTH FACE OF INSCRIPTION ROCK

Sept. 17.





undertake the task of making the relation, and will dispatch it to the point you may direct me.

“With nothing more, I am, señor, your obedient servant,

“DONACIANO VIGIL.

“Lieut. J. H. SIMPSON,

“*Topographical Corps, U. S. A.*”

But to proceed with our journey: Lewis thinks the road to Laguna by the way of the *Moro*, or Inscription Rock, and the Pueblo of Acoma, is better for wagons than that which the troops have taken. He says it has only one bad place, and that can be avoided by making a detour of two miles. Water and grass, according to his representation, are ample along it. Carravahal, however, (and a most excellent guide he has proved himself to be,) thinks the other the best, and, according to the map, it would appear to be quite as direct.

As has been already remarked, by 8 o'clock A. M. we were ready to commence our journey—it being our intention to join the main command, if possible, before night. For the first three miles our route lay east of north, when, getting again into the road taken by the troops, we immediately turned to the right upon it—our course thence for the day being nearly due east. This road, we find, gives indications of having been considerably more travelled than that passing by the Inscription Rock. A mile and a half more traversed, over a heavy sandy soil, upon which I noticed the flax growing in its wild state, we found ourselves commencing the ascent of the *Sierra de Zuñi*. This ascent, for a few miles, is quite gradual, the road leading up a beautiful narrow valley, clothed with a rich black loamy soil, and interspersed with large pines. Six and a half miles on the route, I noticed some massive limestone, in large quantities, cropping out from either side of the valley. Some of it is a coarse-grained marble. Two miles further, the ascent becomes quite steep and difficult on account of loose rocks. The route, however, continues practicable for wagons; and no doubt an easier grade could be found, possibly, to the right of the present trail.

A mile further traversed, we found ourselves on the summit of the pass of the *sierra*, from which, bearing north of east, some thirty miles off, we caught sight, for the first time, of one of the

finest mountain peaks I have seen in this country. This peak I have, in honor of the President of the United States, called *Mount Taylor*. Erecting itself high above the plain below; an object of vision at a remote distance;\* standing within the domain which has been so recently the theatre of his sagacity and prowess; it exists, not inappropriately, an ever-enduring monument to his patriotism and integrity. (See Plate 75.)

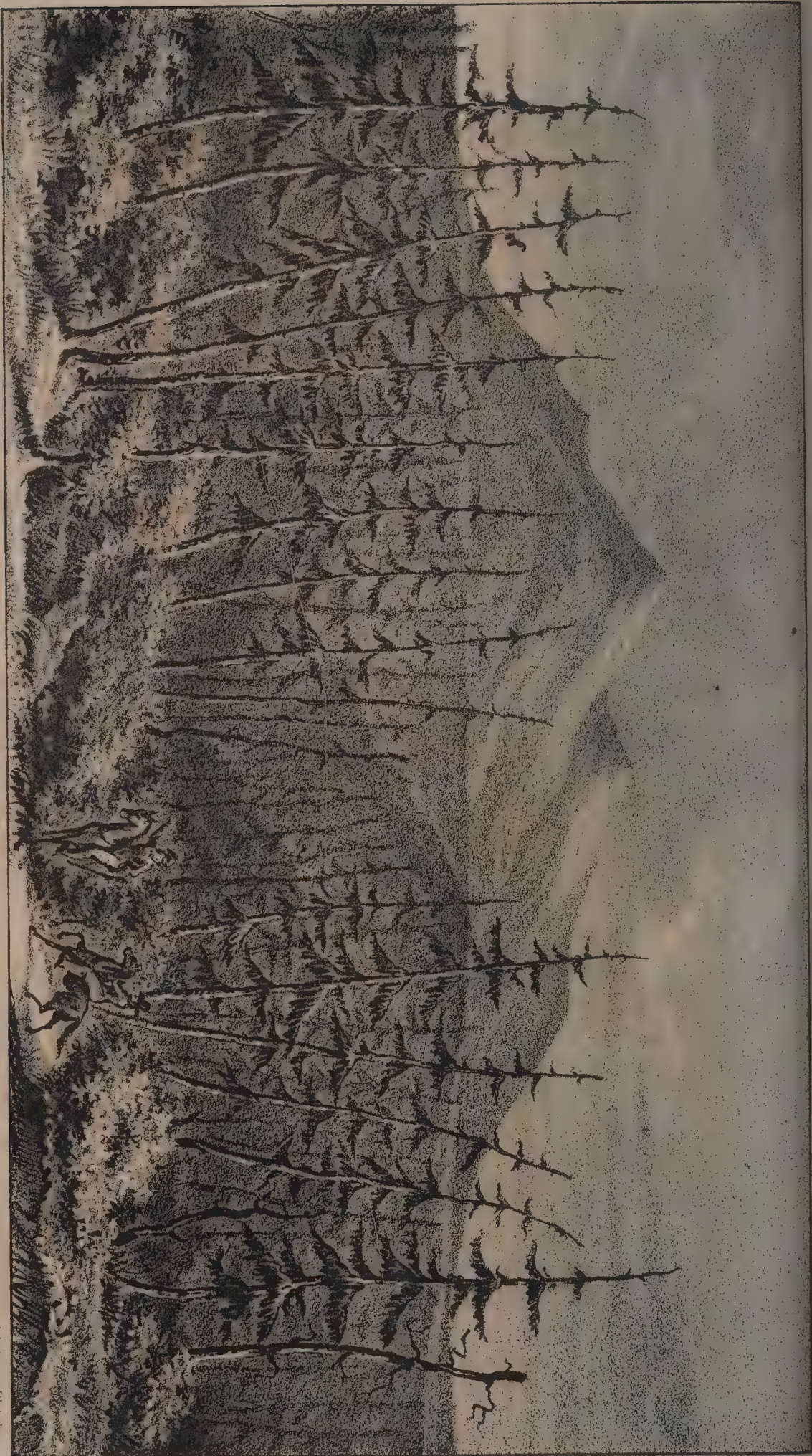
Descending the eastern slope of the *Sierra de Zuñi*, after a ride of two miles, we reached the *Ojo de Gallinas*, where the still smoking embers of recent fires, in connection with their relative positions, showed very plainly the *locale* of the last night's encampment of the troops. Finding some good water and grass here, and being considerably fatigued, we gladly halted for an hour to take a lunch and let our animals graze. Resuming our journey, we passed two miles of very hilly pine-barren country—a mile further bringing us to a locality where, immediately on the right of the road, for the first time, some unseemly piles of blackened scoriaceous volcanic rocks made their appearance. Three miles further, in a kind of basin, we met another series of piles of lava debris, covering an area of at least one hundred acres. These piles look like so many irregular heaps of stone coal. A mile further brought us to the entrance of the *Cañon de Gallo*, down which the route continued its course. This cañon, which is a rather narrow one, and walled on either side by sandstone rocks some three hundred feet high, is quite interesting, both as an object of vision and because of the blackened volcanic scoriaceous rocks which crop out from its bottom. Did this cañon exist before the development of those volcanic rocks, or was it the result of that development? Is it not possible that the incandescent mass below, and the gases generated by the heat, in connection with the rupture of the superincumbent sedimentary strata which such a condition of things would be likely to produce—I say, is it not possible that such a combination of circumstances could have given rise, first to the cañon, and then to the volcanic matter cropping from its bottom?

This cañon is quite rapid in the descent of its bottom—more so than any we have seen. Four miles from its entrance, it is

\* Since my return to Santa Fé, I find this mountain peak can be seen from Fort Marcy and other surrounding heights; the air-line distance being as great as one hundred miles.







R.H. Kern del.

Mo. W. N. T. A. Y. L. G. R.

from the summit of the Zuni Pass. — Sept. 18<sup>th</sup>

E. S. Duval's Steamship Press, Philadelphia



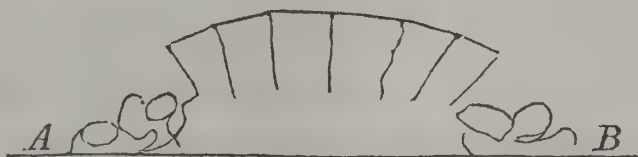
almost choked up with large masses of rock; threading which, however, I subsequently learned, the artillery found little or no difficulty. Three miles further, we debouched from the cañon into the broad, beautiful, and fertile valley of the *Ojo de Gallo*. Bearing thence gradually to the right, four miles further brought us, much to our gratification, just after dark, to the camp of the troops, where we found them all rejoicing in the possession of a fine spring, abundant pasture, and the feelings consequent upon the exhilarating effect of a beautiful and far-extended expanse.

We noticed along the road several rattlesnakes which the troops had killed. One of them was very large.

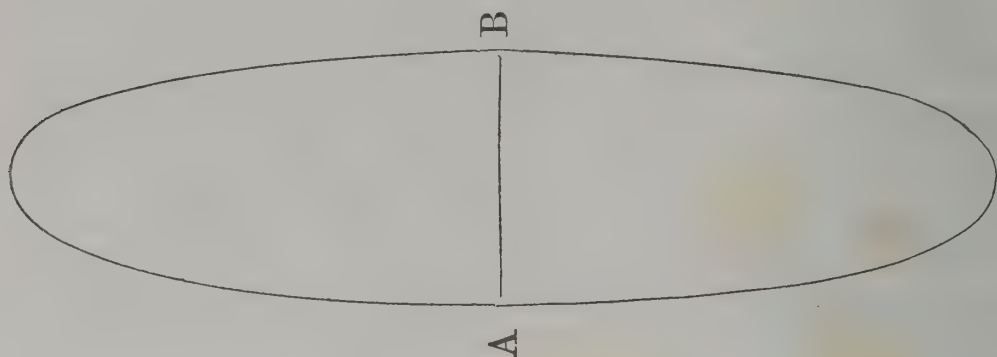
Our day's travel I estimate at thirty-two miles. The march of the troops yesterday, I learn, was 27.14 miles; to-day, 18.49 miles. The latitude of this camp, by observation, is  $35^{\circ} 5' 17''$ .

*Twenty-ninth camp, near Pueblo of Laguna, September 19.*—The troops decamped at 8 A. M., the course, as yesterday, continuing for the day nearly due east. The first six miles was directly across the valley of the Gallo, and then down the valley of the *Rio de San José*. The valley of the Gallo is one of the richest I have seen, its soil being a rich black loam. A great deal of scoriaceous matter, in black, angular fragments, lies scattered over the surface of the valley in piles and ridges: and it is doubtless owing to this source that its soil is so fertile; for wherever this igneous product is observable, there have I noticed the soil in proximity to it to be of this character.

Just before entering the valley of the San José, about seven miles from our morning's camp, are hundreds of acres of volcanic rock, a great deal of it exhibiting, with marked distinctness, the undulations of the wave in its oscillatory motion. I endeavored, by the curvature of these waves, to find, by a normal or rather an applicable radius, the crater or source of the outflow; but it resulted in nothing satisfactory. I ascended an adjoining hill to overlook the whole field, and found the lava to exist in ridges ranging generally north and south, the curvature being thus:—



by a cross section on A B of the ridge or pile, thus:—



This seems to point to a swelling or intumescence of the fluid mass, longitudinally—a partial overflow—and a fixedness of condition, caused by refrigeration, before it could spread laterally to any considerable extent, and subsequently a tumbling in at the sides, from disintegrating causes and the want of subjacent support.

Near this very large field of volcanic matter, the road runs up a long, steep, rocky hill—two miles further bringing us again to the valley of the San José. This hill could probably be avoided by not leaving the valley of the San José at all. Ten miles from our last camp, for about a quarter of a mile, we traversed a sliding rocky hill, where a few picks, crowbars, and spades could, with no great labor, in a short time, make it practicable for wagons. Along this portion of the route, a dense growth of bushes, intertwined with vines, bearing a most delicious grape—its size, that of our winter grape—skirts the stream, and cheered us with its rich luxuriance. The stream here also came tumbling down in a small but beautiful cascade, the din of its waters not being more delightful to the ear than its appearance was to the sight. A mile further, the volcanic rocks which, as far down as this point, have lain along the valley in scattered oblong heaps, terminate. About a mile from this, we crossed the San José; at this point a clear stream, fifteen feet wide and one deep, running swiftly over a gravelly bottom. Willows, I noticed, lined the stream.

The valley, thus far, has been bounded on its left or north side by *mésas* of a sedimentary character, overlaid by amygdaloidal trap; on the right or south side, by sedimentary rocks, the superior formation of which is sandstone.



Three miles from our last crossing of the San José, we crossed it again—the valley, from this point, gradually unfolding itself more uninterruptedly, and continuing so down to Laguna, a distance of fourteen miles, within two miles of which we are encamped. All along the valley, for this distance, the land is cultivated in corn and melons, the luxuriance of their growth attesting the good quality of the soil. I also noticed, at different points, a number of circular places upon the ground where wheat had been trodden out by horses. This is the usual mode in this country of separating it from the husk. The cultivators of the soil are Pueblo Indians, and belong to the villages of *Laguna* and *Acoma*. They were very liberal to us in their donations of muskmelons, of which they seem to have a great abundance. I notice that, to preserve them for winter, they peel them, take out the seeds, and then hang them in the sun to dry. A dry cedar-tree covered with them, for this purpose, presented a very singular appearance.

Within about a couple of miles from our camp, the San José expands into a small lake, which is the resort of large flocks of cranes.

This day's march, 28.93 miles, has been the most fatiguing one we have had—the artillery not getting in, on account of the horses giving out, until after dark. The regular infantry, whether the march is short or long, uniformly preserve the same compact form and rate of travel, and, in this respect, are superior to any troops I have ever served with.

The soil along the route has been arenaceous, and a great deal of it good. No *sylva* to speak of, except near the head of the San José, has been seen in the valley, though scrub cedar has dotted the heights. Bunch and gramma grasses have been seen in patches along the way. The cactus has been quite common.

A flock of two thousand head of sheep was seen by us before reaching camp.

This camp, which observation places in latitude  $35^{\circ} 0' 49''$ , has all the requisites of wood, water, and grass.

The *alcalde* of the *Pueblo de Laguna* called to pay his respects to Governor Washington this evening; and a very respectable man he appears to be. He is more at home in American garb than was the *alcalde* of *Zuñi*.

*Thirtieth camp, September 20.*—The *alcalde* of Laguna was

again in our camp this morning. He represents to Governor Washington that some persons belonging to the party of California emigrants who passed through his village two or three weeks since, on their way west, tied and forced off one of his people to Zuñi, against his will, and then gave him no compensation; that they drove off eight mules belonging to his people, and even tied the governor, because he would not do an impossibility which they wished to exact of him. He also represented that some Mexicans were endeavoring to get from him a pistol which an emigrant had given him in remuneration for his care of him during his illness. Governor Washington told him that he and his people should defend their property, if necessary, even to the taking of life; and that, no matter how many were sacrificed in this way, the government would sustain them in it; that this was a rule of the government under which he was now living. He also gave him a paper, calling on all persons to respect the rights of his people.

This morning I preceded the troops a short while for the purpose of visiting the Pueblo of Laguna. The houses of this pueblo, I find, are built like the others—terrace fashion, each story forming by its roof a platform or sill for entrance to that above, and the ascent from story to story—of which there are, in some instances, as many as three—being by ladders upon the outside. They are built of stone, roughly laid in mortar, and, on account of the color of the mortar, with which they are also faced, they present a dirty yellowish clay aspect.\* They have windows in the basement as well as upper stories; selenite, as usual, answers the purpose of window-lights. The pueblo has one Roman Catholic edifice, which, on account of the key not being immediately available, I did not enter. I noticed in its belfry a couple

\* The idea which is entertained in a recent work, that this pueblo is situated on a rocky promontory, *inaccessible* to a savage foe, is incorrect; as wagons find no difficulty in getting up to and passing directly through the town.

Equally incorrect is the idea that the towns of Pojuate, Cebolleta, Covero, and Moquino are made up of houses *four stories* high, built upon *inaccessible* rocky heights. I have, since the Navajo expedition, made a military reconnaissance of the country in which these towns are situated, and therefore speak from personal observation. It is also a mistake to regard the three last-mentioned towns as *Indian* pueblos; they are *ordinary Mexican* villages.



of bells, and on its roof a sort of dial—probably a mock one. Corn in the shuck, after having been boiled, as also strings of red pepper, could be seen hanging up in front of nearly every house to dry. Indeed, the evidences are that these people are quite industrious and thrifty. Their cattle—of which, probably on account of the good pasturage in the vicinity, they seem to have more than any other pueblo—look fine; and their sheep and goat folds—which, as usual, encroach upon the circuit of the towns, much to the annoyance of both sight and smell—show also that they are well supplied with this species of stock. I noticed also about the place a number of carts, of the ordinary lumbering Mexican make. The population of the town is probably about eight hundred.

A large portion of the inhabitants are at this time away, gathering *piñones*, an edible fruit of the piñon, the common scrub pine of the country. The dress of these people is like that of the other Pueblo Indians—the women, as usual, having the calves of their legs wrapped or stuffed in such a manner as to give them a swelled or dropsical appearance. They, like the Zuñis, regard us with considerable reserve; but how could it be otherwise, when they have been so shamefully treated as they have been recently by persons bearing like ourselves the name of Americans? Common prudence certainly dictates a proper reserve until they can learn by experience that we are not extortioners like some of our forerunners; and this they are beginning to learn, for the longer we are among them the more frank and liberal they become.

The troops passing through the pueblo about 11 o'clock, I left the place to accompany them. The course to-day is south of east, and, as yesterday, the road runs along—though not so near—the San José, which it crosses at Laguna. Just as I got out of the town, observing a Mexican packer appropriating to himself a watermelon, right in the face of an old woman who was guarding the patch, in my indignation I rushed upon him full tilt, and the consequence was an instantaneous disgorgement. The many signs which the old woman made to express her gratitude amply testified how deeply she felt this slight act of humanity. Two miles from Laguna, we descended a rocky shelving-place, to get into the valley of the San José. Wagons will find no insuperable difficulty here. This hill descended, and some

amygdaloidal trap passed, (lying in a short cañon through which the road runs,) the Rio de San José is again crossed—the water, which heretofore has been quite clear, now becoming of a clay color. The river at this point is about twenty feet wide, one deep, and has a muddy bottom. The San José crossed, some old ruins appear, perched upon a *mésa* some one hundred and thirty feet high, immediately on your right. To clamber up to them, I had no little difficulty; and, on reaching them, I found they scarcely compensated me for the exertion. They consisted of a few old stone and mortar structures, and some stone *corrals*, (enclosures,) the latter showing signs of having been recently used as sheep-pens. What a barbarous state of things these ruins, which are occasionally seen on almost inaccessible heights, show to have once existed; and how much more glorious their condition now, when the inhabitants can live upon the plains below in comparative ease and quiet, convenient to their fields, water, and stock!

Shortly after passing the ruins, amygdaloidal trap again appears in the valley; and on the left, immediately by the road, gypsum crops out from overlying sandstone. Eight miles from Laguna, an extensive view unfolded itself to our front, of distant blue mountains, *mésa* heights, tableau and conical mounds—a broad expanse of green valley intervening. Just beyond this point appears, on your left, an almost perfect natural *fac-simile* of a house with its chimney-top. About a mile further, to our right, on the far side of the Rio San José, could be seen the remains of a Mexican village called *Rito*, which is represented, and no doubt truthfully, to have not long since been deserted on account of the water of the San José failing at this point. This is the village before referred to as illustrating the fact that at the present day, as in more remote periods, towns are deserted on account of the water near them giving out. (*Ante*, September 17.) A few miles beyond this spot, the colonel commanding noticing a very large herd of sheep moving very hastily away from the command, as if all were not right, I rode off to see how the matter stood. I soon discovered, however, that the flock was under Mexican and not Navajo control, and from my conversation with the *pastor*, became assured that our apprehensions were groundless. It was beautiful to see the young shepherd carrying in his bosom a little lamb; and it at once suggested to me the force



and appropriateness of the sentiment to be found in Isaiah, (chapter 40, verse 11,) expressive of the care of the Saviour for the tender ones of his flock: "He shall feed his flock like a shepherd; he shall gather the lambs with his arm, and carry them in his bosom."

About fifteen miles from Laguna, it being represented by Carravahal that we could get water in the San José, about a mile and a half to the right, we turned off the beaten track to encamp upon the stream. The water of this stream at this point is scarcely an inch in depth, and of a bright red color. Its constancy cannot be depended upon. Good bunch grass is found in the vicinity, and wood about half a mile off.

The road to-day has been generally quite good. Gypsum crops out on the left all along the way for the last six miles. The soil has been argillaceous, and, in spots of limited extent, looks as if it might produce pretty well. The sylvia has been the dwarf cedar sparsely scattered.

The Mexican mounted militia were discharged this evening, the colonel commanding tendering them his thanks for their services, and strongly reprobating the conduct of those who had deserted the command, and whom he hoped they would, on their return to their homes, hold up to the just ignominy which they deserved.

*Thirty-first camp, Atrisco, opposite Albuquerque, September 21.*—The wolves, last night, in the vicinity of our camp, were more uproarious than usual.

The troops resumed their march at 7 A. M., the course for the day being about north of east. The country to-day has been generally rolling in the direction of our progress—for the first six or seven miles, *mésa* heights, with intervening areas of prairie land, being seen on our left. Soon after leaving camp, we could see ahead of us the serrated mountains of the Rio Grande stretching from north to south, looking blue and beautiful, and further to the south a couple of twin peaks lifting themselves high and conspicuously. Between four and five miles on our route, the highest point of the Santa Fé mountains showed themselves for the first time, bearing northeast, the prospect suggesting the pleasing thought that our labors would soon terminate. Eight miles further brought us to the Rio Puerco, in the bed of which not a drop of water could be seen. The broad bed

of this so called river is about one hundred feet across; the narrower about twenty feet. A few cottonwood-trees skirt the banks. Between three and four miles beyond the Puerco, earthy limestone crops out from the soil. Proceeding a few hundred yards further, we reached the summit of a swell of land, whence could be seen the broad valley of the Rio Grande, the mountains just back of Albuquerque now showing themselves in all the magnificence of their proportions. Shortly after, much to our relief, we met a wagon loaded with barrels of water, which had been sent out by Major Howe, from Albuquerque, agreeable to the instructions of the colonel commanding, forwarded by express. The men were exceedingly thirsty, and drank correspondingly. When within seven miles of the Rio Grande, we caught, much to our delight, the first sight of its glimmering waters. A mile further, we fell in with a couple more of wagons from Albuquerque, loaded with water and forage for the troops. The river, however, being but five or six miles ahead, the order was given to continue forward. Two miles more brought us where we could see the town of Albuquerque quartering on our left; houses could also be seen lying scattered for miles up and down the river, the cottonwood very sparsely dotting its banks. Just at dusk, we were winding our way through the little village of *Atrisco*, situated on the Rio Grande, opposite Albuquerque—our camp for the night being to the north of the town, in the midst of a fine plot of pasturage, convenient to the river.

The soil to-day has been alternately argillaceous and arenaceous. The face of the country presented one expanse of barren waste, thinly sprinkled with dwarf cedar. The last half of the road was, a good portion of it, very heavy on account of sand, and in places quite hilly. The day's march has been 28.33 miles.

We met on the road to-day three Mexican men on horseback, two of them each with a woman behind him, and the third with a very pretty child in his arms. This is a common mode of travelling among them—the woman, however, most generally sitting in front. These women had their faces plastered with a sort of whitewash, also a very common fashion—the object being, as I am told, to protect them from the weather. Not unfrequently they are covered with a red pigment—but for what purpose, unless for the same reason the whitewash is used, I cannot divine. The fact, however, of their more frequently put-



ting it on in blotches, would seem to point to some other object. But, whatever be the purpose, they in both instances give to the face a frightful and disgusting appearance.

Sad news has reached us to-night. The mail from the States, for which we all have been looking with so much anxiety, is reported to have been cut off by the Navajos, on its way out to us at *Chelly*. This is a serious disappointment to us all.

*Algadones, September 22.*—The expedition, in its *integrity*, terminated at *Atrisco*. The different commands, artillery and infantry, are to march independently, each under the head of their respective chiefs, to Santa Fé, as soon as practicable. Colonel Washington and staff crossed over to Albuquerque this morning at the ford. The river at this point is probably about three hundred yards wide, the stream rapid, its depth four feet, and its bottom of a somewhat quicksand character. During the higher stages of the water, the river is too deep to be forded; but, though this is the case at the several fords along its course, boats seem never to be resorted to by the Mexicans. Indeed, I have not seen a single one since I have been in the country.\*

Albuquerque, for a Mexican town, is tolerably well built. Its buildings, like all I have seen inhabited by Mexicans, are of a right parallelopipedon shape, constructed of adobes, (blocks of sun-dried mud,) and arranged generally on the four sides of a rectangle, thus creating an interior court (*pateo*) upon which nearly every one of the apartments opens. There is generally but one exterior or street entrance; and this is generally quite wide and high, the usual width being about six feet, and the height seven. They appear to be made thus wide, at least as far as I have been able to discover, to enable the burros (asses) and other animals to go through with their packs. They are generally secured by double doors. There are two or three buildings in the town with extensive fronts and *portales*, (porches,) which look, for this country, very well—one of the buildings being the house formerly occupied by Governor Armijo. There is a military post at this place, garrisoned by a couple of companies of dragoons, the commanding officer being Major M. S. Howe, of the 2d dragoons. The population of the town and its immediate

\* Since writing this, I have crossed the Rio Grande, near Albuquerque and Socorro, in a ferry-boat.

suburbs is probably about one thousand. Wood for fuel has to be drawn a distance of twenty-five miles.

Colonel Washington and myself, after partaking of the generous hospitality of Major Howe and his lady, left at two o'clock for Santa Fé, it being our intention to tarry all night at Algodones, the usual stopping-place for travellers either way between Albuquerque and the former place. Mr. Calhoun and Captain Ker were in company, the latter having kindly provided the vehicle which conveys us hither. On our left was the Rio Grande, and on our right, some eight or nine miles off, the lofty mountains of Albuquerque and Sandia. The valley of the Rio Grande, for a number of miles above Albuquerque, presents the finest agricultural and pastoral country I have yet seen in New Mexico. The breadth of the valley under cultivation is probably not quite a mile. The clemency of the climate—it is some two thousand feet lower in altitude than Santa Fé—is such as to cause the grape and peach, as well as the melon, to grow to perfection. The corn also looks luxuriant and productive.

About six miles from Albuquerque, we passed the inconsiderable village of *Alameda*, the most conspicuous building in it being the Roman Catholic church. Six miles further, we passed by the pueblo of *Sandia*, a town similar in the style of its buildings to the other pueblo villages—the usual quantum of ladders and ragged-looking sheep and goat pens discovering themselves about the premises. Just after leaving Sandia, within the space of about a mile along the road, are between sixty and seventy piles of stones, which are said to designate the localities where as many Navajos fell in a battle which the Pueblo Indians had with that people some years since. Six miles more brought us to the small village of *Bernalillo*, its vicinage presenting some respectable-looking *rancho* residences, surrounded by well-cultivated grounds, which are fenced by *adobe* walls. Some of these walls are twelve feet high, and crowned with the cactus, to prevent their being scaled. Another six miles traversed, we found ourselves at Algodones, our stopping-place for the night. This miserable-looking village contains about forty houses, and has a population of some two or three hundred souls. Subsistence, such as it is, and forage, can be obtained here. The inn, kept by a Mexican, is far from being such as it should be, either as respects cleanliness or the character of the *cuisine*. Miserable



muddy coffee, a stew made of mutton smothered in onions, half-baked *tortillas*, (thin corn-cakes,) and a few boiled eggs, constitute the best meal it pretends to furnish. I do not know why it is, but I have not yet drunk a cup of coffee or eaten a *tortilla* of Mexican preparation, without its creating in some degree a sensation of nausea at the stomach. There is certainly great room for improvement in the *cuisine* of this country. The only eatable I have yet partaken which does not become tainted by their cookery is the egg in its boiled state, and this is doubtless owing to its being protected by the shell.

The road from Albuquerque to Algodones is generally sandy, and in some places, on account of it, quite heavy.

*Santa Fé, September 23.*—Having by a few moments of experience last evening become convinced that, if I lay within doors all night, I should not only have a fight with rabid insects, but have also great violence done to my *olfactories*, Lieutenant Ward and myself slept in the wagon; and a pretty comfortable night we have had of it.

We left Algodones for Santa Fé at half-past 7 A. M., our general course for the day being about northeast, and we taking the road *via* Delgado's *rancho*, (farm,) the usual wagon-route between the two places.

Amygdaloidal trap, I noticed, crowned the *mésa* heights on the west side of the Rio Grande between Algodones and San Felipe, the inferior formation appearing to be sandstone, horizontally stratified.

Six miles above Algodones, we passed the pueblo of *San Felipe*. This town is situated at the foot of the *mésa* on the west side of the Rio Grande, the river contracting at this point to a width of probably less than one hundred yards. This pueblo, like the others, has its two-storied houses, accessible by ladders; but neither it nor Sandia is as purely Indian in the style of its buildings as the other pueblos we have visited. It is, however, rather a neat-looking village, the Roman Catholic church, as usual, showing conspicuously. The ruins of what is usually called *Old San Felipe* are plainly visible, perched on the edge of the *mésa*, about a mile above the present town, on the west side of the river. These ruins are generally, I believe, regarded as indeed the remains of Old San Felipe; but a very intelligent

Indian, residing in the present town of that name, has informed me that they are the remains of a people who have long since passed away, and of whom they know nothing. Half a mile above San Felipe, the road branches off—one branch extending to Santa Fé by the way of Santo Domingo, and the other to the same place by the way of Delgado's rancho, (farm.) The former branch is probably slightly shorter than the latter and better watered; it is on that account generally preferred for pack animals. The latter, however, is so much the better wagon-road as to cause it to be preferred for vehicles.

About twenty miles from Algodones, we crossed the Rio Galisteo, the road following it up for some distance. Where but at the point where we left it, about half a mile above, it was we first met it, not a particle of water could be seen in its bed, a running stream. Colonel Washington informs me that, in Chihuahua, he traversed the bed of a river which was perfectly dry when the head of the column commenced crossing; but within half an hour, before the whole column had passed over, it was scarcely fordable.

Some fine specimens of trap dyke are discoverable just after crossing the Rio Galisteo—one of them resembling, as nearly as may be, an artificial wall; another, the dark-colored remains of an old pueblo. About six miles further we crossed the small affluent of the Rio de Santa Fé, on which Delgado's *rancho* is situated. Travellers sometimes make this rancho a stopping-place for the night between Santa Fé and Albuquerque. Sixteen miles more traversed, at half-past three in the afternoon, much to the gratification of the whole party, we reached Santa Fé.

The road from Algodones to Santa Fé is generally very good, the only exception being a few short, steep hills.

The face of the country to-day has presented, with some trifling exceptions—along the Rio Grande, at Delgado's, and between Agua Fria and Santa Fé—one extended barren waste of uncultivable soil.

*Santa Fé, September 26.*—The artillery, under Major Kendrick, reached this place yesterday; the infantry, under Captain Sykes, to-day.



*Character of the soil from the eastern base of the Sierra de Tunecha to Chelly, and thence to Santa Fé, by the return route.\**

It may be thought, from the frequent mention of good land along the route since we left the eastern base of the Tunecha mountains, on our return trip, that fertility has characterized the country generally through which we have passed since that period. But, lest so erroneous an impression may obtain, I think it proper to observe that, for the greater portion of this distance, the road has threaded the valleys of the country, and therefore the land has presented itself such as I have described it. The country, it is true, has exhibited a greater extent of cultivable soil than that traversed between Santa Fé and the Tunecha mountains, but yet, in comparison with the whole area of surface, it should still be considered as but a *very small fractional part*.

The idea I pertinaciously adhered to when in the States, before ever having seen this country, was, that, besides partaking of the bold characteristics of the primary formations—rocks confusedly piled upon rocks, deep glens, an occasional cascade, green, fertile valleys—the usual accompaniments of such characteristics with us in the States—it was also, like the country of the States, generally fertile, and covered with verdure. *But never did I have, nor do I believe anybody can have, a full appreciation of the almost universal barrenness which pervades this country, until they come out, as I did, to “search the land,” and behold with their own eyes its general nakedness.* The primary mountains present none of that wild, rocky, diversified, pleasing aspect, which they do in the United States, but, on the contrary, are usually of a rounded form, covered by a dull, lifeless-colored soil, and generally destitute of any other sylvia than pine and cedar, which is most frequently of a sparse and dwarfish character. The sedimentary rocks, which, contrary to my preconceived notions, *are the prevalent formations of the country*, have a crude, half-made-up appearance, sometimes of a dull buff color, sometimes white, sometimes red, and sometimes these alternating, and, being almost universally bare of vegetation, except that of a sparse, dwarfish, sickening-colored aspect, cannot be regarded,

\* See *ante*, thirteenth camp, August 31, for general character of the country traversed *east* of the Sierra de Tunecha.

as a general thing—at least, not until familiarity reconciles you to the sight—without a sensation of loathing. The face of the country, for the same reason—the general absence of all verdure, and the dead, dull, yellow aspect of its soil—has a tendency to create the same disagreeable sensation. I desire it, therefore, to be borne in mind that, when I have in the course of my journal spoken of *fertile* soil, or of *beautiful* prospects, I have spoken *relatively*—that is, in relation or contrast with the other portions of the country in which these exceptions have occurred, *and not in relation to our more favored domain in the States.*

### CONCLUSION.

Before concluding my journal, I think it proper to bring to the notice of the department the expediency of having the country examined west of the Pueblo of Zuñi, for the ascertainment of a wagon-route from that town to the Pueblo de los Angeles, or, failing in this, to San Diego.

The route from Santa Fé to Zuñi—a distance of two hundred and four miles—is, with a very slight application of labor, practicable for wagons; and the guide, Carravahal, who has been down the Rio de Zuñi to its junction with the Colorado of the West, says it continues practicable all the way along this tributary to the point mentioned.

Mr. Richard Campbell, of Santa Fé, since my return, has informed me that, in 1827, with a party of thirty-five men and a number of pack animals, he travelled from New Mexico to San Diego by the way of Zuñi and the valley of the Rio de Zuñi, and found no difficulty throughout the whole distance. He further states, there is no question that a good wagon-route, furnishing the proper quantum of wood, water, and grass, can be found in this direction, both to San Diego and the *Pueblo de los Angeles*. He informs me, however, that, in order to reach the Rio Colorado, the Rio de Zuñi would have to be diverged from at the falls, within a few miles of its confluence with the Colorado, and a valley running generally southwardly followed down to its junction with the valley of that river.

He has further informed me that above the mouth of the Rio de Zuñi there is a ford, called *El Vado de los Padres*, (the Ford of the Fathers,) to which a route leads from Zuñi by the way of the pueblos of the Moquis. This route, which he represents



as much shorter than the other, is, however, on account of the difficulty of crossing the cañon of the river at the ford, only practicable for pack animals.

The Colorado, when he crossed it, near the mouth of the Rio de Zuñi, was fordable; but he is of the opinion that it might not always be found so.

It is proper for me, however, in this connection, to state that I have conversed with two or three trappers, who represent that the Colorado is so deeply cañoned from its mouth upwards as to make a wagon-route in the direction proposed impracticable. These persons, however, have at the same time stated that they knew nothing personally of the *continuous* existence of this cañon, never having been immediately on the ground: their representations, then, should not counterbalance the statement of those who have been there.

I have introduced the above representations, to which I might add those of other persons, corroborative of the statements of Messrs. Carravahal and Campbell, in order that the Department, being advised of the true state of the information attainable upon the subject, might take such action and give such instructions in the premises as, in its judgment, it might deem expedient.

By reference to the map, it will readily be seen that a route from Santa Fé to Pueblo de los Angeles, in the direction suggested, running as it would, intermediate between the southern detour of Cook's route and the northern detour of the "Spanish trail" route, or, in other words, as direct as possible, would not only be shorter, by probably as much as three hundred miles, than either of these routes, by passing by the pueblos of Laguna and Zuñi, and possibly of the Moquis, situated still further westward, would furnish supplies of subsistence and repairs of outfit for certainly the first two hundred, if not three hundred, miles of the way—*desiderata* certainly not to be disregarded.

Respectfully submitted.

JAMES H. SIMPSON,  
*First Lieutenant Corps Topographical Engineers.*

## APPENDIX A.

LIEUTENANT SIMPSON'S REPORT TO LIEUTENANT-COLONEL WASHINGTON, OF A RECONNAISSANCE WITH A VIEW TO THE ESTABLISHMENT OF A POST ON THE BORDERS OF THE NAVAJO COUNTRY.

SANTA FÉ, *October 10, 1849.*

SIR: In accordance with orders No. 35, current series, issued from headquarters of department No. 9, requiring me to make a reconnaissance of the country in the vicinity of Cebolleta, with a view to the selection of a suitable position for a post in that vicinity, I have the honor to report that I have made the reconnaissance required by said order, and present the following as the result.

The point I would suggest as the most suitable one for the location of a post is the small settlement called Cebolletita, situated two and a quarter miles to the south of, and in the same valley with, Cebolleta, and on the road leading from the Pueblo of Laguna to Cebolleta. My reasons for this selection are involved in the following considerations:—

The Navajo nation is the principal one to which the post in question, in its military aspects, is to have relation. Coming from the mountains immediately to the *north* and back of Cebolleta, (see map,) and passing by Cebolleta and Cebolletita, is an avenue of approach from the Navajo country to the Mexican settlements in that and the neighboring quarter to the east of it. To the *east* of the selected point, I was informed there was another or other avenues of approach. To the *west*, by the way of the valley of the Rio de San José and one of its tributaries, there are two other avenues of descent to be guarded against. Now, as the number of posts to be established is but one, it is obvious that its position should be such as to affect the greatest possible area of country, and that in the most prompt and effective manner. This position, evidently, then, should be a central one. This condition is fulfilled in the case in question by locating the post at the place stated—Cebolletita.

The next considerations are, that the locality selected is where the essentials, wood and water, are abundant for the troops, grass



abundant for the stock, and corn doubtless to be had in sufficient quantities from that and the neighboring villages.

In regard to the quarters at the point referred to, there are three *ranchos*, upon which are buildings suitable—with some slight repairs, in the case of one—for the quarters of the troops. These buildings belong, respectively, to Juan Chavez, Manuel Chavez, and José Francisco Arogonas; and the order in which they are named is the order of their convenience in respect to wood and water. The first two, I was assured, could be rented; the third, in all probability, if necessary, could be also.

In regard to the facilities of communication, there is a pack-mule route from Cebolletita to Albuquerque, the distance between the two places being represented to be from forty-five to fifty miles. There are also two wagon-roads from Cebolletita to Albuquerque—one by way of the Pueblo de Laguna, which we found pretty good; and the other, a more direct one, by the way of Alamo, said to be the shorter, and equally good. The distance to Albuquerque by the Laguna road is: to Laguna, sixteen miles; thence to Albuquerque, forty-five miles—in all, sixty-one miles.\*

The valley in which it is proposed to locate the post, I would further remark, besides being the most pleasant one I saw within the circuit of my reconnaissance, is more thickly populated with Mexicans than any in that region.

Another advantage the locality possesses is its proximity to the friendly Navajos—a position which enables them to be reciprocally protected by our troops, and at the same time give that information in relation to their neighbors which might be of the highest importance to us in our relations with them.

I should not fail to report that the escort accompanying me was commanded by Lieutenant John Buford, of the 2d dragoons, whom I ever found willing and effective in his co-operation with me in the discharge of my duties.

I am, &c.,

J. H. SIMPSON,

*First Lieutenant Corps Topographical Engineers.*

To Lieutenant-Colonel J. M. WASHINGTON,

*Commanding 9th Military Department.*

\* Since the establishment of the post at Cebolleta, a wagon-route has been discovered from that post to Santa Fé, by the way of the Pueblo of Jémez, which, doubtless, is from fifteen to twenty miles shorter than by the way of Albuquerque.

## APPENDIX B.

A COMPARATIVE VOCABULARY OF WORDS IN THE LANGUAGES OF THE PUEBLO OR CIVILIZED INDIANS OF  
NEW MEXICO, AND OF THE WILD TRIBES INHABITING ITS BORDERS.

Name of the object in English.	IN THE LANGUAGE OF THE PUEBLO INDIANS OF—						IN THE LANGUAGE OF THE WILD TRIBES DENOMINATED—		
	Santo Domingo, San Felipe, Santa Anna, Silla, La- guna, Pojuate, Acoma, Cochiti. (1.)	San Juan, Santa Clara, Saldefonso, Pojuate, Nambe, Tesuque.(2.)	Taos, Picoris, San- dia, Isleta. (3.)	Jémez and Old Pecos. (4.)	Zuñi. (5.)	Moqui. (6.)	Navajos. (7.)	Jicorillas (a branch of the Apaches). (8.)	Utahs. (9.)
God	Dios (Sp.), Mon- tezuma, they say, is synony- mous with Dios.	Give no other word than the Sp. Dios.	Huam-may-ah	Pay. (Same as for sun.)	Ho-ae-wo-nae-we- o-nah	Toe-kill	Yuah-del- kill	Dios. (Span.)	
Heavens		Pah	Hoo-len-nah	Pay	Yat-tock-kah	Toke-pay-lah. Tah-wah	Cho-hae- nae-i		Tap.
Sun		Poy-ye	Pan-nah	Pah-ah	Mo-yat-chu-way	Moo-yah	Old-chay		Mah-tots.
Moon	She-cat	A-doy-e-ah	Hah-he-glan-nah	Woon-hah		O-mow.	Del-gay-he		Quah-lantz.
Star		Nah	Pah-han-nah	Dock-ah	Ou-lock-nan-nay	Touch-quae	Ne	Nay	Toe-on-pay- ah.
Cloud	Hah-ats	Say-en	Tah-hah-ne-nah	Shu-o-tish	Oat-se	Se-ke-ah	Ten-nay	Tin-day	Nai-yah.
Earth	Hats-see	Ker	Clay-an-nah	Ste-osh	O-care		Es-ten-nay	Jay-kay	Ah-pats.
Man		Nah-ve-so	Could give no word	Ne-ohoy	Could give no word		Cha-at	Pe-aug-oo-le.	
Woman	Nai-at-say	An-noh	Oy-you-oo-nah	Ah-cue	Art-se-ke		Che-yaz	Is-ke-e	
Wife	Kar-nats-shu	An-ugh	Koo-ay-lon-nah		Tza-nah			Mun-che che- to. (Doubtless a corruption of <i>mucha- chita.</i> -Span.)	Mah-mats.
Boy	O-nne								
Boy (infant)	Sah-wish-sha								
Girl	Koy-yah								
Girl (infant)	Sah-wish-sha	Pum-bah	Pi-ne-mah	Fond-o-hos-che	We-at-zah-nah		Chay-way	It-se	Tuts.
Head	Nash-can-ne	Sic-co-vah	Pah-hem-nah	Chit-chous	O-shuck-quin-nay	Qua-tah	Hut-se	Pin-nay	Mut-tock.
Forehead	Cop-pay			Wah-pay	Huck-kin-nay	Col-ler	Hut-tah		



Face	Ko-wah	Cha-ay	Cha-gah-neem-may	Tcho-lah	No-pon-ne-nay	Po-se	Hun-ne	Pin-dah	Koo-elp.
Eye	Kan-nah	Chay	Chenay	Saech	Too-nah-way	Ya-kuck	Hun-nah	Witch-chess	Put-ty-shoe.
Nose	Kar-wish-she	Shay	Poo-ae-nah	For-saech	No-lin-nay	Mo-ah	Hut-chin	Huz-zay	Mah-ve-tah.
Mouth	Tsee-kah	Sho	Clah-mo-e-nah	E-ae-quah	Ae-wah-tin-nay	Tah-mah	Huz-zay	E-gho	Timp.
Teeth	Har-at-chay-nay	Moo-ah	Moo-en-nah-en-hay	Goo-whan	O-nah-way	Ling-a	How-go	E-zah-te	Tong.
Tongue	Wah-at-chin	Hah	May-on-on-en-ah	Ain-lah	Ho-nin-nay	Ke-at	Hot-so	E-zay-tah	Ah-oh.
Chin	Tzars-kah	Sab-boh	Clah-bon-hay	Ah-tish	Klay-which-chin-nay		Hi-ot ze		Hah-nock-quell.
Far	Kah-u-pah	O-ye-o	Tag-lay-o-nay	Wash-chish	Lah-schuck-tin-nay	Nock-a-wuck	Hut-chah	Wick-jah	Nink.
Hair	Har-tran	Poh	Pah-han-nay	Fore-lah	Ti-ah-way	Hay-me	Hot-se	It-se	Su-oo.
Neck	Wit-trah-ne	Kah	Gah-ne-may	Toe	Kiss-sin-nay	Qua-pe	Huck-quoss	Wit-cost	Kolph.
Arm	Kah-u-may	Ko	Hah-en-nay	Hah	Ar-se-way	Mah at	Hut-con	Wit-se	Poo-ir.
Elbow	Kah-mosh-tay	Mah		Mah-tish	Shon-che-way	Cher-ber.	Hul-lah	Wis-lah	Mas-seer.
Hand	Quaist-pah	Pe-ah	Pah-ah-kay-nay-ne-may	Pay-lu	Po-at-tan-nay	Mock-tay	Hay-yete	Ko-jay-ae	Pay.
Finger	Kay-ah-kah		Pah-nay	Hong	Sack-que-way	Ho-kah	Hut-yah	Wit-cha-te.	
Breast	Kar-tay		E-en-en-nah	Awn-dash	Wake-que-a-way	Tom-me.	Hut-kay	Wit-kay	Namp.
Leg	Ke-ah-ne	Ah	Tah-mean-mah	Pah-ah	Too-she-kay-one-nay	Her-kuck	Pay-ye	Pay-ay.	
Knee	Moo-shats	Kah	Kah-nah-neem-mah	Toss-chach	Too-she		A-yan-ne	Yah-nay.	
Foot	Kah-yai-oh	As in Span.	Kah-wan-nah	Gu-wah	Too-she	As in Spanish.	Kle	Shle	Kak-vah.
Deer	(Probably a corruption of the Span. <i>caballo</i> .)		(Probably a corruption of the Span.)						
Buffalo	Skers-ker	Could give no word.	Hatch-oo-nah	Pay-chu-lah	Che-to-lah		Kot-so	Ko-oh	Toe-wero.
Horse	Shrue-o-we	Poy-yoh	Pi-ho-own	Kae-ah-vae-lah	Wat-se-tah	Po-ku	Klish.	Klin-cha-ah	Sah-reets.
Serpent	Tish	Cher	So-dor-nah	Can-nu	Moo-sah		Klay-cho	Moo-sah	Moo-sah.
Rattlesnake	Moos	Moo-sah	Moo-se-e-nah	Moos-sah	Mack-ke	Day-bor	Moose	Cone	Coon.
Dog	Hah-kan-ye	Fah	Pah-an-nah	Fwa-ah	Ke-a-o-way	Ser-her-be	El-chin	Ko	Oof.
Cat	Fire	Sun	Poh-ah-oon	Pah			Toe		Pah.
Fire	Water	Ogh		Ke-ah-ah.	Tze-nan-nay.	Kar-uk.			
Wood	Stone			Te-ah	Melah	Se-ka-mo-se.			
Water	Cactus	Sow-wah							
Stone	Corn								
Corn	Bean								
Bean	Bread	As in Span.	Ah-coon-nah	Zo-tane-bae-lah	Moo-lun-nay		Pah.	Klay-tun-chay.	
Bread	Pah. (Probably a corruption of the Span. <i>pan</i> .)						Pah.	Klay-tun-chay.	
Flesh	Ish-sha-ne	Pe-we	Toe-an-nay	Gu-nay-wat-si	She-lay		Pah.	It-se.	

## APPENDIX B—Continued.

IN THE LANGUAGE OF THE PUEBLO INDIANS OF—							IN THE LANGUAGE OF THE WILD TRIBES DENOMINATED—		
Name of the object in English.	Santo Domingo, San Felipe, Santa Anna, Silla, La- guna, Pojuate, Acoma, Cochiti. (1.)	San Juan, Santa Clara S Aldefonso, Pojuaque, Nambu, Tesuque.(2.)	Taos, Picoris, San- dia, Isleta. (3.)	Jémez and Old Pecos. (4.)	Zuñi. (5.)	Moqui. (6.)	Navajos. (7.)	Jicorillas (a branch of the Apaches). (8.)	Utahs. (9.)
Bow	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	Au-tah.			
Arrow	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	Ho-huck.			
Fusil	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	A-muck-te			
Sword	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	Se-po-wah.			
Spurs	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	Se-pom-uck ke.			
Whip	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	Wo-bock-pe.			
Pipe	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	Chong.			
Hat	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	Pa-ta-nock-a- chee.			
Friend	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •		Pay-dil-ston	Ick-kay.	

## NOTES.

- (1.) Obtained by Lieutenant Simpson from U-kat-te-wah (all the world looks as the man that sings), governor of the pueblo of Santo Domingo.
- (2.) Obtained by Lieutenant Simpson, through Mr. E. M. Kern, from an Indian belonging to the pueblo of San Juan.
- (3.) Obtained by Lieutenant Simpson, through Dr. Horace R. Wirtz, U. S. A., from an Indian belonging to the pueblo of Taos.
- (4.) Obtained by Lieutenant Simpson from an Indian belonging to the pueblo of Jémez, by name Da-ha-du-lu (eagle).
- (5.) Obtained by Lieutenant Simpson from a friendly Navajo chief, by name Tus-ca-ho-gont-le. Mexican name, Sandoval.
- (6.) Obtained by Lieutenant Simpson from a friendly Navajo chief, by name Tus-ca-ho-gont-le. Mexican name, Sandoval.
- (7.) Obtained by Lieutenant Simpson from an Apache Indian, a prisoner in the guard-house at Santa Fé.
- (8.) Obtained by Lieutenant Simpson from an Apache Indian, a prisoner in the guard-house at Santa Fé.
- (9.) Obtained by Lieutenant Simpson from an Apache Indian, a prisoner in the guard-house at Santa Fé.

In all such syllables as ah, may, nah, tah, &c., a has the same sound as in fat.

In all such syllables as ay, may, nay, kay, &c., a has the same sound as in fate.

The following Indian names were obtained by Lieutenant Simpson, through Mr. R. H. Kern, from Indians belonging to the pueblos named:—

The Indian name of the pueblo of Santa Anna is Tom-i-ya.

Santo Domingo is Ge-e-way.

do. do. is Ko-che.

do. do. is Tse-ah.

do. do. is Tse-ah.

do. do. is Tse-ah.

do. do. is Tse-ah.

do. do. is Tse-ah.

do. do. is Tse-ah.

do. do. is Tse-ah.

do. do. is Tse-ah.

I am informed that the Indians of the Pueblo de Lentas have lost their original tongue, and now speak entirely the Spanish language. The only tribes which, in the above vocabulary, discover any obvious affinity in their languages, are the Navajos and the Jicorillas. It is, however, somewhat remarkable that the word for eat (moose), with some slight variations, should be found common to them all.



## APPENDIX C.

ASSISTANT SURGEON HAMMOND'S DESCRIPTION OF A ROOM FOUND  
AMONG THE RUINS OF THE PUEBLO BONITO.

CAÑON DE CHAI, UPPER CALIFORNIA,  
*September 7, 1849.*

SIR: At your request, I send you a description of a room that I saw, in company with Mr. Collins of Santa Fé, in the ruins of the Pueblo Bonito, in the Cañon of Chaco, on the 28th ult.

It was in the second of three ranges of rooms, on the north side of the ruins. The door opened at the base of the wall, towards the interior of the building; it had never been more than two feet and a half high, and was filled two-thirds with rubbish. The lintels were of natural sticks of wood, one and a half to two and a half inches in diameter, deprived of the bark, and placed at distances of two or three inches apart; yet their ends were attached to each other by withes of oak with its bark well preserved. The room was in the form of a parallelogram, about twelve feet in length, eight feet wide, and the walls, as they stood at the time of observation, seven feet high. The floor was of earth, and the surface irregular. The walls were about two feet thick, and plastered within with a layer of red mud one-fourth of an inch thick. The latter, having fallen off in places, showed the material of the wall to be sandstone. The stone was ground into pieces the size of our ordinary bricks, the angles not as perfectly formed, though nearly so, and put up in break-joints, having intervals between them, on every side, of about two inches. The intervals were filled with laminæ of a dense sandstone, about three lines in thickness, driven firmly in, and broken off even with the general plane of the wall—the whole resembling mosaic work. Niches, varying in size from two inches to two feet and a half square, and two inches to one and a half feet in horizontal depth, were scattered irregularly over the walls, at various heights above the floor. Near the place of the ceiling,

the walls were penetrated, and the surfaces of them perpendicular to the length of the beam. They had the appearance of having been sawed off originally, except that there were no marks of the saw left on them; time had slightly disintegrated the surfaces, rounding the edges somewhat here and there. Supporting the floor above were six cylindrical beams, about seven inches in diameter, passing transversely of the room, and at distances of less than two feet apart—the branches of the trees having been hewn off by means of a blunt-edged instrument. Above, and resting on these, running longitudinally with the room, were poles of various lengths, about two inches in diameter, irregularly straight, placed in contact with each other, covering all the top of the room, bound together at irregular and various distances, generally at their ends, by slips apparently of palm-leaf or marquez, and the same material converted into cords about one-fourth of an inch in diameter, formed of two strands, hung from the poles at several points. Above, and resting upon the poles, closing all above, passing transversely of the room, were planks about seven inches wide, and three-fourths of an inch in thickness. The width of the plank was uniform, and so was the thickness. They were in contact, or nearly so, admitting but little more than the passage of a knife blade between them, by the edges, through the whole of their lengths. They were not jointed; all their surfaces were level, and as smooth as if planed, excepting the ends; the angles as regular and perfect as could be retained by such vegetable matter—they are probably of pine or cedar—exposed to the atmosphere for as long a time as it is probable these have been. The ends of the plank, several of which were in view, terminated in line perpendicular to the length of the plank, and the plank appears to have been severed by a blunt instrument. The planks—I examined them minutely by the eye and the touch, for the marks of the saw and other instruments—were smooth, and colored brown by time or by smoke. Beyond the plank nothing was distinguishable from within. The room was redolent with the perfume of cedar. Externally, upon the top, was a heap of stone and mud, ruins that have fallen from above, immovable by the instruments that we had along.

The beams were probably severed by contusions from a dull instrument, and their surfaces ground plain and smooth by a



slab of rock; and the plank, split or hewn from the trees, were, no doubt, rendered smooth by the same means.

Very respectfully, your obedient servant,

J. F. HAMMOND,

*Assistant Surgeon U. S. Army.*

First Lieut. J. H. SIMPSON,

*Corps Topographical Engineers, U. S. Army.*

## APPENDIX D.

SCHEDULE OF MINERALS COLLECTED BY LIEUTENANT J. H. SIMPSON, CORPS OF TOPOGRAPHICAL ENGINEERS, ALONG THE ROUTE FROM SANTA FÉ, NEW MEXICO, TO CHELLY, IN THE NAVAJO COUNTRY, VIA SANTA DOMINGO, JÉMEZ, AND PASS WASHINGTON OF THE SIERRA DE TUNÉCHÁ, AND FROM CHELLY BACK TO SANTA FÉ, BY THE WAY OF ZUÑI, LAGUNA, AND ALBUQUERQUE, IN THE FALL OF 1849.

No. of specimen.	LOCALITY.			REMARKS.
	Name.	Latitude.	Longitude.	
		Deg. min. sec.	Deg. min. sec.	
1	Valley of the Rio Jémez.	35 46 00 N.	106 47 00 W.	Found about an abandoned furnace.*
2	do.	35 48 00	106 48 00	Incrustations about mouth of Los Ojos Calientes (hot springs). Thermometer, when immersed, rose to 169° Fahrenheit. Eggs were cooked in from 15 to 20 minutes, and venison in a much shorter time. Boiling point of water at the Pueblo of Jémez, several feet lower in altitude, 190°.
3	Cañon de Penasca	35 34 00	106 57 00	
4	do.	35 38 00	107 00 00	
5	Cañon de la Copa	35 40 00	107 11 00	Found in thin seams in sandstone formation.
6	do.	35 40 00	107 11 00	Found in crevices of sandstone rock, and sometimes adhering to the face of the rock.
7	Sierra Madre (or highlands) dividing the waters of the Atlantic from those of the Pacific.	35 51 00	107 29 00	Scoriaceous matter protruding through an argillaceous rock which is burnt to different degrees of calcination and underlaid by a friable sandstone of a dirty yellowish color.
8	Sierra de los Mimbres.	35 51 00	107 29 00	Broken off a stump, which, by falling over, had split into two parts. Length of stump 4 feet diameter; in its integrity 2½ feet. Some stumps still standing upright, <i>in place</i> , upon the surface of a very shallow basin. Bituminous coal cropping from the soil in close proximity. Drawings of these petrifications accompany my report.

\* Believing that the department could submit the specimens to a competent geologist for examination, I have thought it would best comport with accuracy to defer presenting their scientific names until they could be given by such authority.



APPENDIX D—*Continued.*

No. of specimen.	LOCALITY.			REMARKS.
	Name.	Latitude.	Longitude.	
		Deg. min. sec.	Deg. min. sec.	
9	Pueblo Pintado (one of the ruins of Chaco).	35 58 00 N.	107 47 00 W.	A fragment of a stone taken from a front face of the structure; its thickness about the ordinary thickness of the building material.
10	Cañon of Chaco.	. . . .	. . . .	Found on the side of a knoll.
11	Tunéchá valley.	. . . .	. . . .	Found in fragments ever since we left the valley of the Rio Puerco. Bituminous coal of a slaty character in connection with arenaceous and argillaceous rocks, being in association with it.
12	East base of the Sierra de Tunéchá.	36 12 00	108 52 00	Bituminous coal, as above stated, has been found co-extensive with the country lying between the valley of the Rio Puerco and the east base of the Sierra de Tunéchá, or through a longitudinal interval of $1\frac{3}{4}^{\circ}$ , but none so good as that illustrated by the specimen presented. This last crops out from the escarpment of an <i>arroyo</i> in beds from 2 to 3 feet thick, interstratified with argillaceous shale.
13	Pass Washington of the Sierra de Tunéchá.	36 3 22	108 56 00	Similar specimens found at other points of the Sierra de Tunéchá along the route.
14	Sienéguilla de Tuanita (Little John's meadows).	36 10 36	109 12 15	Found strewn extensively over the meadows.
15	Cañon of Chelly.	36 7 00	109 16 00	Broken from a petrified tree which protruded horizontally from the north escarpment of the Cañon of Chelly, its end only being visible. Diameter of tree, 1 foot. Found in drift conglomerate, this formation alternating with sandstone rock composing the superincumbent mass of rock to the top or crest of the cañon, or for a height of about 300 feet.
16	Cañon of Chelly.	36 7 00	109 16 00	Found on a shelf of the north wall of the cañon about 300 feet below the top or crest.
17	. . . . .	35 12 00	109 11 00	Found strewn over an argillaceous soil of a reddish color.

APPENDIX D—Continued.

SCHEDULE OF MISCELLANEOUS SPECIMENS FOUND ALONG AND  
NEAR THE ROUTE.

No. of specimen.	LOCALITY.			REMARKS.
	Name.	Latitude.	Longitude.	
		Deg. min. sec. Between	Deg. min. sec. Between	
18	Ruins in Cañon of Chaco.	35 37 00 & 36 04 00 N.	107 47 00 & 108 08 00 W.	Fragment of the end of a floor beam 6 inches in diameter, also of a piece of board; each showing an end just as it was found; also specimens of the brushwood and bark which sustain upon the floor beams the superincumbent flooring of mud mortar; also a specimen of a rope found depending from the ceiling of one of the rooms.
19	Ruins of Chaco. } Ruins of Cañon of Chelly. } Ruins of Inscription or Moro rock. }	. . . .	. . . . .	Specimens of pottery found at the ruins mentioned.
20	Navajo country.	. . . .	. . . . .	Got from a Navajo Indian; precise locality not known.
21	Vicinity of Santa Fé.	. . . .	. . . . .	These calcareous fossils were found imbedded at foot of west slope of Santa Fé (Rocky) mountains. Dip of beds about 45° eastward, or toward the axis of the range. Contiguous to the calcareous outcrop, and on its west side, is an outcrop of micaceous slate anticlinal to the limestone formation; or, in other words, it has a dip westward of about 45°. Does not this relation show that the limestone must have been deposited <i>subsequent</i> to the elevation of the Rocky Mountains, but <i>prior</i> to the upheave of the slate formation? All the specimens except the yellowish one, which was got from a neighboring locality, and doubtless from the same formation, show signs of having been slightly calcined in the kiln which is at the outcrop.



APPENDIX E.

TABLE OF GEOGRAPHICAL POSITIONS.

Number of camp.	Place of observation, and name of locality.	DISTANCES, MEASURED BY ADOMETER, IN MILES AND HUNDREDS.		North latitude.	LONGITUDE WEST FROM GREENWICH.		AUTHORITIES.	
		From camp to camp.	From Santa Fé.		In time.			In arc.
					<i>h.</i> 7	<i>m.</i> 04		
To	Santa Fé	16.02	16.02	35 41 06	7 04 10	106 02 30	Bvt.-Major W. H. Emory.	
1	Sienéguita, on Rio Santa Fé.	14.85	30.87	35 30 56	7 55 59	106 29 45	Lieut. J. H. Simpson.	
2	On Rio Grande, opposite Santo Domingo	26.60	57.47	35 36 07	7 07 25	106 51 15	do.	
3	One-third of a mile north of Jémez	5.78	63.25					
4	Three miles south of San Isidora	16.27	79.52					
5	On Rio de Chacoli	13.27	92.79	35 46 13	7 08 13	107 03 15	do.	
6	Cañada de Piedra de Lumbre	13.55	106.34	35 50 31	7 09 35	107 23 45	do.	
7	Cañon de Torrejon	21.45	127.79	35 56 27	7 11 04	107 46 00	do.	
8	One mile S. E. of ruins of Pueblo Pintado	14.86	142.65					
9	Vicinity of Mesa Fachada	24.53	167.18					
10	Tunéchá valley	14.60	181.78	36 04 35	7 14 38	108 39 30	do.	
11	Tunéchá creek	17.21	198.99	36 12 59	7 15 22.68	108 50 45	do.	
12	(Estimated)	4.32	203.31					
13	Pass Washington (estimated)	10.00	213.31	36 07 42	7 15 37	108 54 15	do.	
14	Sienéguita Chicita (estimated)	6.00	219.31	36 03 22	7 15 44	108 56 00	do.	
15	Sienéguita de Juanito	12.00	231.31	36 02 07	7 16 23	109 05 45	do.	
16	Cascade creek	13.43	244.74	36 10 36	7 16 49	109 12 15	do.	
17	Two miles W. of N. from mouth of the Ca-	7.39	252.13					
18	ñon of Chelly	26.45	278.58	36 09 04	7 18 50	109 42 30	do.	
19	Sierra de Laguna	20.50	299.08					
20	Cañoncito Bonito	24.83	323.91		7 17 02	109 15 30	do.	
21	Spring	23.02	346.93		7 17 14	109 18 30	do.	
22								

APPENDIX E—Continued.

Number of camp.	Place of observation, and name of locality.	DISTANCES, MEASURED BY ADOMETER, IN MILES AND HUNDRETHS.		North latitude.	LONGITUDE WEST FROM GREENWICH..			AUTHORITIES.
		From camp to camp.	From Santa F <sup>e</sup> .		In time.		In arc.	
					<i>h.</i>	<i>m.</i>		
23	.	8.29	355.22	°   '   "	°   '   "			
24	.	12.08	367.30	35   11   56	7   16   27	109   06   45		Lieut. J. H. Simpson.
25	Two and a half miles N. E. from Zuñi	17.45	384.75					
26	Ojos del Pescado . . . . .	13.71	398.46	35   05   12	7   14   46	108   41   45		do.
27	Ojo del Gallenas . . . . .	27.14	425.60					
28	Ojo del Gallo . . . . .	18.49	443.09	35   05   17	.	.	.	do.
29	Two miles N. W. of Pueblo de Laguna	28.93	472.02	35   00   49	.	.	.	do.
30	On Rio de San José . . . . .	18.51	491.53					
31	Atrisco, opposite Albuquerque	28.33	519.86					
32	One mile above Bernalillo . . . .	20.70	540.56					
32	Crossing of Rio Gallesteo . . . .	22.83	571.31					
33	Delagados <i>Rancho</i> . . . . .	7.92						
	Santa F <sup>e</sup> . . . . .	15.80	581.11	35   41   06	7   04   10	106   02   30		Bvt.-Major W. H. Emory.

APPENDIX F, or *Table of Astronomical Observations*, on account of its scientific rather than popular character, is omitted in this edition.

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